DxMONITOR

Animal Health Report

Inside this Issue

Fall 1992

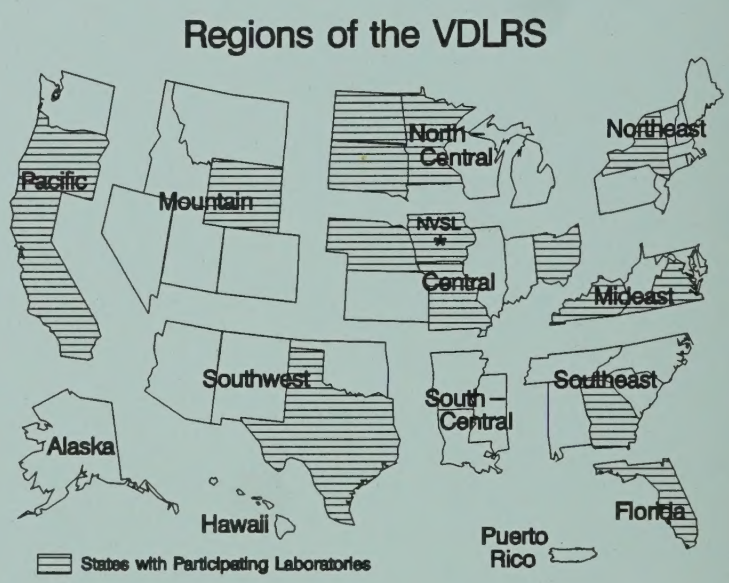
The DxMONITOR Animal Health Report is distributed quarterly as part of the Veterinary Diagnostic Laboratory Reporting System (VDLRS). The VDLRS is a cooperative effort of the American Association of Veterinary Laboratory Diagnosticians (AAVLD), the United States Animal Health Association (USAHA), and the United States Department of Agriculture, Animal and Plant Health Inspection Service (USDA:APHIS). The purpose of the DxMONITOR is to report trends of confirmed disease diagnoses and animal health data collected from veterinary diagnostic laboratories and the USDA:APHIS.

Caution should be taken when extrapolating information reported in the DxMONITOR due to the inherent biases of submitted specimens. Trends should be interpreted with care. An increase in the number of positive tests for a given diagnosis/agent may be the result of a true increase in prevalence, however, it may only reflect a new State testing requirement, a heightened awareness of the condition, or an increase in the number of laboratories reporting data.

For this issue, the disease reporting period for new data was April 1, 1992 through June 30, 1992. Data have been reported by diagnostic laboratories in the States indicated below, from the National Veterinary Services Laboratories (NVSL), and from the APHIS:Veterinary Services program staffs.

Abbreviations for regions used in this issue are:

AK = Alaska
CL = Central
FL = Florida
HI = Hawaii
ME = Mideast
MN = Mountain
NC = North-Central
NE = Northeast
PA = Pacific
PR = Puerto Rico & U.S. Virgin Islands
SC = South-Central
SE = Southeast
SW = Southwest
UNK = Unknown



Contributing Laboratories

The following laboratories have contributed data reported in the DxMONITOR Animal Health Report. Thanks to all of the individuals at these laboratories who have worked to make this report possible.

- **California Veterinary Diagnostic Laboratory System (Davis, CA)**
- **Bureau of Diagnostic Laboratories, Florida Department of Agriculture (Kissimmee, FL)**
- **Veterinary Diagnostic Laboratory, University of Georgia (Athens, GA)**
- **Veterinary Diagnostic and Investigational Laboratory, University of Georgia (Tifton, GA)**
- **Veterinary Diagnostic Laboratory, Iowa State University (Ames, IA)**
- **National Veterinary Services Laboratories (Ames, IA)**
- **Breathitt Veterinary Center, Murray State University (Hopkinsville, KY)**
- **Livestock Disease Diagnostic Center, University of Kentucky (Lexington, KY)**
- **Minnesota Veterinary Diagnostic Laboratory, University of Minnesota (St. Paul, MN)**
- **Veterinary Medical Diagnostic Laboratory, University of Missouri-Columbia (Columbia, MO)**
- **Veterinary Diagnostic Center, University of Nebraska-Lincoln (Lincoln, NE)**
- **New York State Veterinary Diagnostic Laboratory, Cornell University (Ithaca, NY)**
- **North Dakota Veterinary Diagnostic Laboratory, North Dakota State University (Fargo, ND)**
- **Reynoldsburg Laboratory, Ohio Department of Agriculture (Reynoldsburg, OH)**
- **Animal Research and Diagnostic Laboratory, South Dakota State University (Brookings, SD)**
- **Veterinary Diagnostic Laboratory, Oregon State University (Corvallis, OR)**
- **Texas Veterinary Medical Diagnostic Laboratory, Texas A&M University (College Station, TX)**
- **Bureau of Laboratory Services, Virginia Department of Agriculture and Consumer Services (Richmond, VA)**
- **Wyoming State Veterinary Laboratory (Laramie, WY)**

Lab Notes

This section presents short descriptions of current investigations, outbreaks, or events of potential interest to diagnostic laboratories. The purpose is to provide a forum for timely exchanges of information about veterinary diagnostic laboratory activities. Submissions from nonparticipating laboratories are welcome.

Transmissible Venereal Papilloma Diagnosed in Swine

A herd of 300 sows maintained primarily to raise and sell breeding animals had an unusually high incidence of "bloody urine" in young boars. Approximately 70 percent of the boars (nearly 2,000/year) developed "bloody" urine between 3-5 months of age. Affected animals often had swollen prepuces caused by 1 to 2 liters of retained, red-brown, discolored urine.

Two of the affected boars were necropsied. Gross and histopathologic lesions were limited to the mucosa of the preputial sheath. The entire preputial lining was covered by irregular papillomatous growths measuring 1-2 cm in diameter. There were no growths on the penis of either animal. The urine trapped within the prepuce contained blood, a few epithelial cells, bacteria, and keratinized debris.

Microscopic examination of preputial masses revealed multiple squamous papillomas (warts) characterized by extreme and uneven hyperplasia (acanthosis), parakeratosis, and hyperkeratosis of the preputial epithelium with marked prolongation of rete pegs. An admixture of inflammatory cells was in the dermis. The center of each papilloma appeared to have varying degrees of necrosis with bacteria present within the necrotic debris.

Preputial tissues from the affected areas of each boar were cultured for viruses. Cytopathic effects occurred in porcine fallopian tube cell cultures by 5 days post-inoculation. As yet, the virus has not been identified, but it is suspected to be a papilloma virus.

Treatments currently being used are manual excoriation of a small area of the affected tissue and flushing of the prepuce with neomycin solution. The lesions disappear within 10 days, possibly due to a self-generated immune response. We are currently evaluating autogenous vaccines for the treatment and prevention of this disorder. There is no evidence that the disease has spread from this herd.

Transmissible venereal papilloma should be considered in the differential diagnosis of hematuria and preputial swelling in swine. Manual palpation and visual examination of the preputial mucosa provides sufficient evidence for a presumptive diagnosis. The diagnosis can be confirmed by histologic examination of affected tissue and virus isolation. Genital papillomas of swine appear to be uncommon. A literature review revealed only a single occurrence in 1961 (1,2). It is possible, however, that the disease often goes unrecognized and is currently under-diagnosed and under-reported.

It is interesting to note that the lesions in the present case are similar to condyloma acuminatum of man, a genital papilloma (1). Numerous animals, including non-human primates, cattle, horses, dogs and bears, have been recognized as having papilloma virus infections of the lower genital tract; however, none are suitable as animal models for research on this disease for various reasons (3). The pig might meet the requirements as a more acceptable animal model.

References

1. *Parish, W.E. 1961. A transmissible genital papilloma of the pig resembling condyloma acuminatum of man. J Path Bact 81:331-345.*
2. *Parish, W.E. 1962. An immunological study of transmissible genital papilloma of the pig. J Path Bact 83:429-442.*
3. *Sundberg, J.P. and Reichmann, M.E. Venereal papilloma and squamous cell carcinoma. Comparative Pathology Bulletin Vol. XXII, No. 2. May 1990.*

Contact: Dr. Grant Spearman, Manitoba Veterinary Services Branch, Winnipeg, Manitoba, (204) 945-7639.

Feline Fur Mite Reappears in Florida

Mites collected from a 5-year-old neutered cat were identified by the National Veterinary Services Laboratories (NVSL) as the feline fur mite (*Lynxacarus radovskyi tenorio*). The NVSL indicated that this mite was first identified in 1974 on cats in Hawaii. Since then, it has been identified in Fiji, Puerto Rico, and Australia. The mite was also found in Florida in 1979 (Coral Gables) and 1990 (Volusia County). The current finding involved a cat from Titusville (Brevard County). Brevard and Volusia counties are contiguous.

Contact: Dr. Harvey Rubin, Kissimmee Animal Laboratory, (407) 846-5200.

Competitive Enzyme-Linked Immunosorbent Assay (C-ELISA): Now an Official Test for Bluetongue Exports to Canada

A recent decision by Agriculture Canada has made the bluetongue (BT) competitive enzyme-linked immunosorbent assay (C-ELISA) an official test for the importation of live ruminants and their semen and embryos into Canada. Effective August 1, 1992, either the BT C-ELISA or the BT agar gel immunodiffusion (AGID) test is acceptable for qualifying animals to enter Canada. Testing with either C-ELISA or AGID will be limited to laboratories accredited to do BT testing. The BT C-ELISA is likely to become the only official BT test for Canada.

The C-ELISA was first described by Dr. John Anderson, Institute for Animal Health, Pirbright, England, using a monoclonal antibody he developed. This test was evaluated by scientists in Australia, Canada, and at the National Veterinary Services Laboratories (NVSL). The evaluation was coordinated by scientists from the International Atomic Energy Agency, Vienna, Austria. Dr. Anderson's C-ELISA procedure, after some modification, was established as the "gold standard." DiagXotics, Inc., Wilton, Connecticut, developed a commercial BT C-ELISA, the Blue Plate Special, which was evaluated against this "gold standard" and was licensed and approved by the U.S. Department of Agriculture (USDA). The Canadian scientists also evaluated the Blue Plate Special and concurred with the USDA decision.

The BT C-ELISA test is slightly more sensitive than the BT AGID; therefore, it is possible to have a positive BT C-ELISA but a negative BT AGID test on the same serum. The BT C-ELISA test is also more specific than the BT AGID; therefore, many of the BT AGID positive samples will be C-ELISA negative. Many of the animals exposed to epizootic hemorrhagic disease virus will be BT AGID positive but BT C-ELISA negative. In addition, nonspecific positive BT AGID reactions have been observed.

Contact: Dr. A. D. Alstad, NVSL, (515) 239-8551.

Surveillance for Bovine Spongiform Encephalopathy Continues in the U.S.

Histopathologic examination of bovine brain specimens is the most practical way to conduct surveillance for bovine spongiform encephalopathy (BSE), the most recent addition to the group of transmissible spongiform encephalopathies. Information regarding surveillance examinations for BSE in U.S. cattle is needed by various individuals and groups including regulatory agencies for actions that can affect domestic and international trade.

A cooperative project between Iowa State University (ISU) and the USDA:APHIS was initiated in 1990 to examine brain specimens from cattle which could have had BSE. Specimen submission criteria were that (1) the cattle be 2 years of age or older, (2) they have documented signs of neurologic disease, and (3) they have received protein supplement as a substantial part of their ration. Also, examinations of rabies suspect cases that were rabies negative were undertaken at the Centers for Disease Control in Atlanta, Georgia, and at ISU. In addition, efforts were made to obtain information from veterinary diagnostic laboratories regarding results of bovine neurologic examinations.

Collectively, 474 bovine brain examinations have been reported (as of August 26, 1992). None of the brains have been found to contain lesions with the characteristics and distribution typical for BSE. Lesions characterized by inflammation (e.g. listeriosis), degeneration (e.g. polioencephalomalacia), and neoplasia (e.g. meningioma) have been found; however, most of the cases (approximately 50%) have been categorized as no significant findings.

Contact: Dr. Lyle Miller, Iowa State University, (515) 294-0873.

I. Patterns of Selected Diseases

Section I contains information on diseases of interest as defined by the Office International des Epizooties' (OIE) list B. The purpose of reporting these data is to monitor confirmed cases of specific diseases on a State-by-State or regional basis so that national distributions can be mapped and evaluated.

Key to Figures in this Section:

- In some cases, the reported number of negative tests performed is a minimum because some laboratories were not able to determine the total number of negative tests performed.
- Data are presented by region or State of specimen origin and quarter year of specimen submission.
- Abbreviations for regions used in the figures are:

AK = Alaska	MN = Mountain	SC = South-Central
CL = Central	NC = North-Central	SE = Southeast
FL= Florida	NE = Northeast	SW = Southwest
HI = Hawaii	PA = Pacific	UNK = Unknown
ME = Mideast	PR = Puerto Rico & U.S. Virgin Islands	

☐ Bovine Brucellosis

Source: Dr. Mike Gilsdorf
USDA:APHIS:VS
Cattle Diseases Staff
(301) 436-4918

Reactor herd = Herd with at least one case of brucellosis confirmed by serology or culture.

Definition of State Classifications:

Class B: More than 0.25%, but less than 1.5% of all herds infected.

Class A: No more than 0.25% of all herds infected.

Free: No infected herds under quarantine during the past 12 months.

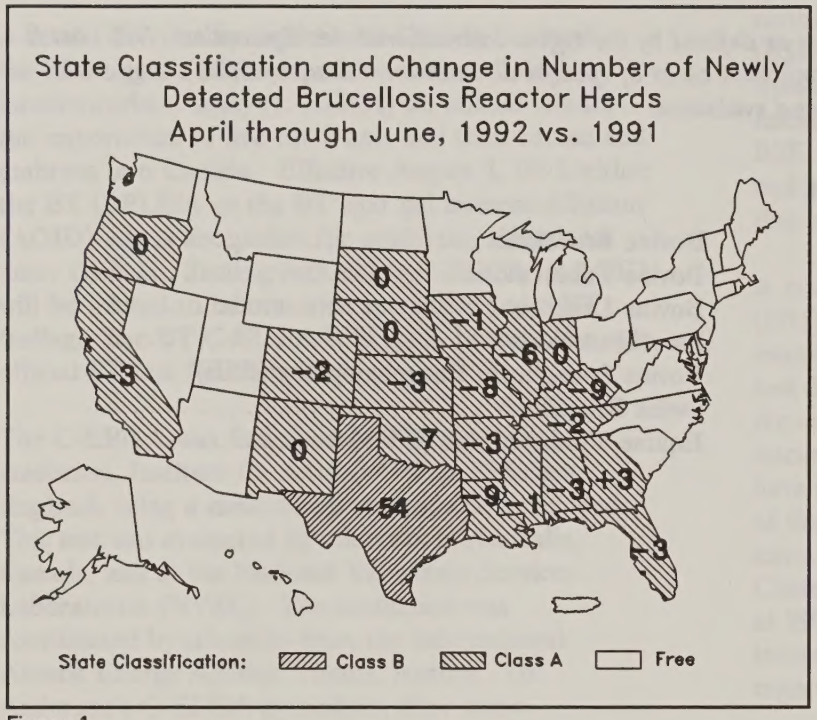


Figure 1

Florida and Louisiana have advanced from Class B to Class A status, leaving only Texas as a Class B State. The decrease in number of brucellosis reactor herds detected from April through June, 1992, as compared to the same quarter of 1991, was led by Texas which had 54 fewer reactor herds detected. Only Georgia had more reactor herds detected during this period of 1992 than during the same period of 1991 (Figure 1).

For the entire U.S. there were 132 reactor herds detected from April through June, 1992. That was 111 fewer herds than were identified from April through June of 1991. Texas had 67 of the 132 reactor herds detected (Figure 2).

The U.S. has had 40 percent fewer (483 vs. 809) brucellosis reactor herds detected during the last 4 quarters than during the previous 4 quarters (Figure 3). For the calendar year-to-date there have been 239 reactor herds found, 210 fewer than were found through June of 1991. Only Iowa and Georgia have had more reactor herds detected in 1992 than during the same period in 1991 (one more each).

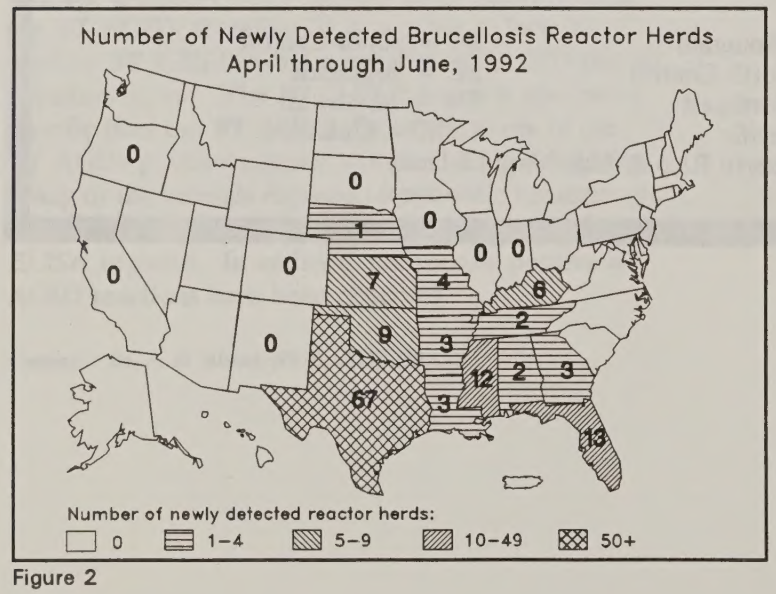


Figure 2

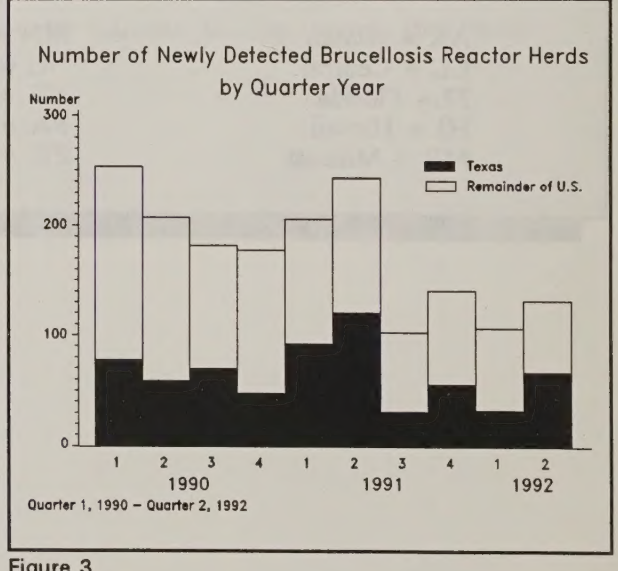


Figure 3

☐ Bovine Tuberculosis

Source: Dr. Mitch Essey
USDA:APHIS:VS
Cattle Diseases Staff
(301) 436-8711

Infected = Laboratory confirmed existence of bovine tuberculosis, either through *Mycobacterium bovis* isolation or positive histopathology.

Exposed = Believed to be infected but laboratory confirmation of *M. bovis* does not exist.

Three bovine herds, two in New York and one in Pennsylvania, were identified as infected with tuberculosis from April through June, 1992. A total of 15 bovine herds were infected with *M. bovis* in the U.S. as of July 1, 1992.

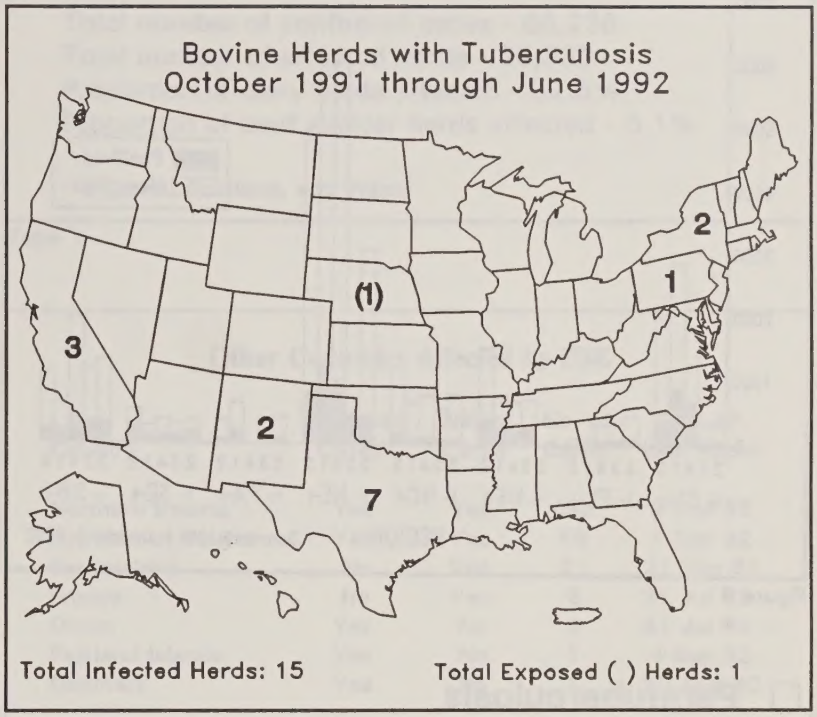


Figure 4

Pending = Herd evaluation still in progress.

Of the 13 captive cervid herds found to be infected with bovine tuberculosis from January 1991 through June 1992, 8 were made up of deer and 5 of elk. Two of the deer herds were located in New York, two in Montana, and one each in Wisconsin, Texas, Idaho, and Nebraska.

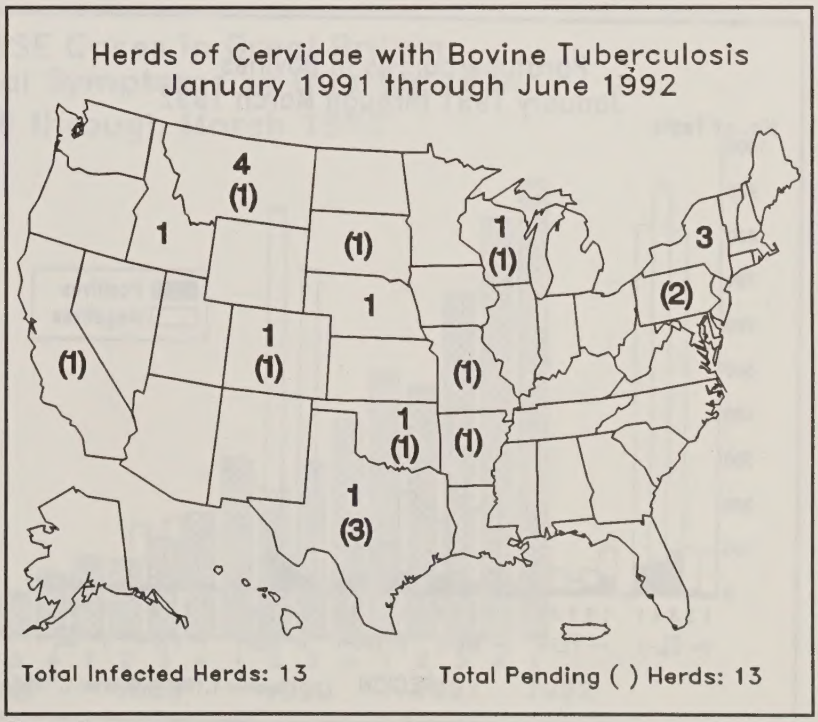


Figure 5

☐ Bovine Leukosis

Criteria: AGID or pathology

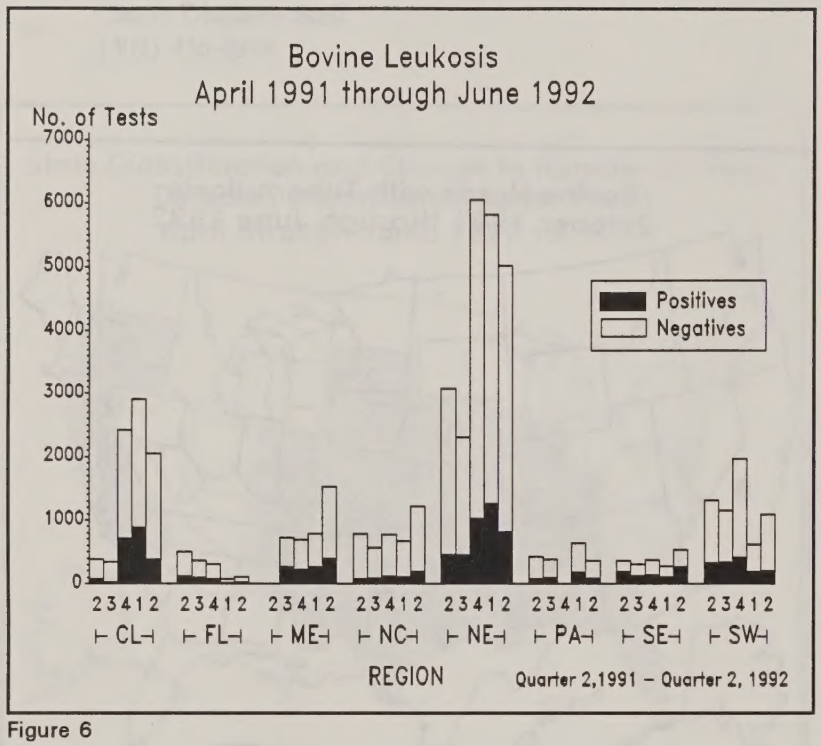


Figure 6

For the first and second quarters of 1992 (January through June), the most positive tests for bovine leukosis (2,084) were reported for specimens from the Northeast (NE) region. During that period, more than twice as many total specimens from the NE were tested as from any other region. There were 1,270 positive tests reported for specimens from the Central (CL) region, with 4,960 total tests performed on such specimens.

☐ Paratuberculosis

Criteria: Culture or histopathology

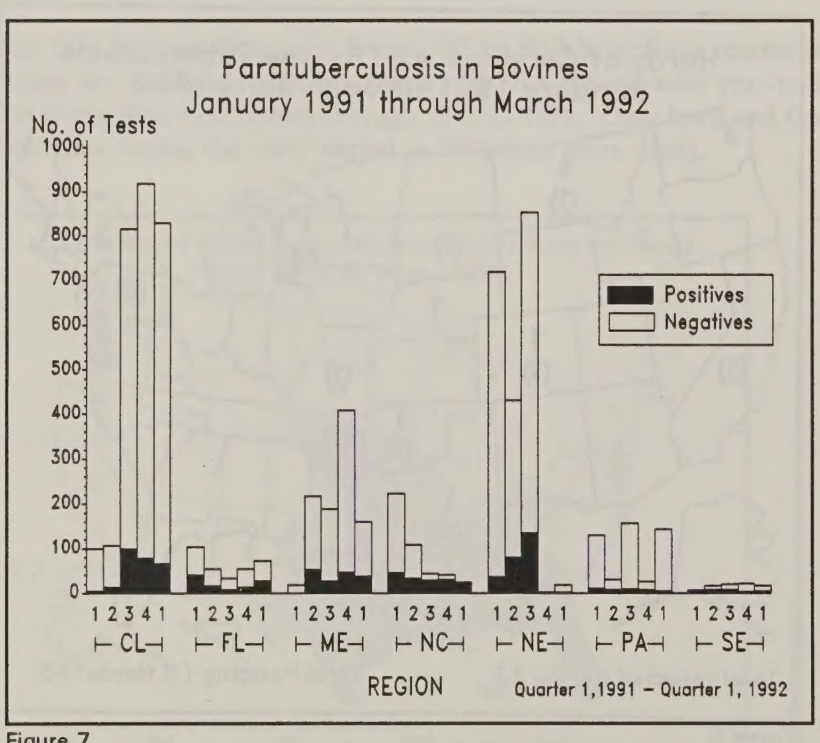


Figure 7

There were no more than 67 specimens reported as testing positive for bovine paratuberculosis from any region for the first quarter of 1992. Over 800 specimens from the Central region were tested to find those 67 positives. No other region had more than 159 total tests reported for the quarter.

☐ Bovine Spongiform Encephalopathy (BSE)

Sources: Dr. O. Denny, Northern Ireland
Dr. A. Doherty, Republic of Ireland
Dr. B. Hornlimann, Switzerland
Dr. J. Wilesmith, Great Britain

Despite ongoing surveillance, bovine spongiform encephalopathy (BSE) has never been diagnosed in the U.S. (see "Lab Notes", page 2). An update on the situation elsewhere in the world is presented here.

Great Britain has now had over 68,000 confirmed cases (Table 1). The first case in Denmark was recently reported (Table 2). It was a cow imported from, and probably infected in, Great Britain. Neither Denmark, Oman, nor the Falkland Islands is known to have had a case of BSE in native cattle.

The numbers of confirmed BSE cases in Great Britain through March 1992 are shown by quarter year of clinical symptom onset in Figure 8. The numbers are not more current because the period from clinical onset to confirmation may be up to 6 months. The number of new cases is expected to begin to decline sometime in 1992.

Bovine Spongiform Encephalopathy
Descriptive Epidemiological Statistics for Great Britain*
As of September 4, 1992

Total number of confirmed cases - 68,236
Total number of affected herds - 20,339
Proportion of dairy herds affected - 37.5%
Proportion of beef suckler herds affected - 6.1%

* England, Scotland, and Wales

Table 1

Other Countries Affected by BSE

Country	Imported Cases	Native Cattle	No. of Cases	Date of Last Report
Northern Ireland	Yes	Yes	482	3 Sep 92
Republic of Ireland	Yes	Yes	58	1 Sep 92
Switzerland	No	Yes	21	21 Sep 92
France	No	Yes	5	31 Jul 92
Oman	Yes	No	2	31 Jul 92
Falkland Islands	Yes	No	1	4 Sep 92
Denmark	Yes	No	1	10 Aug 92

Table 2

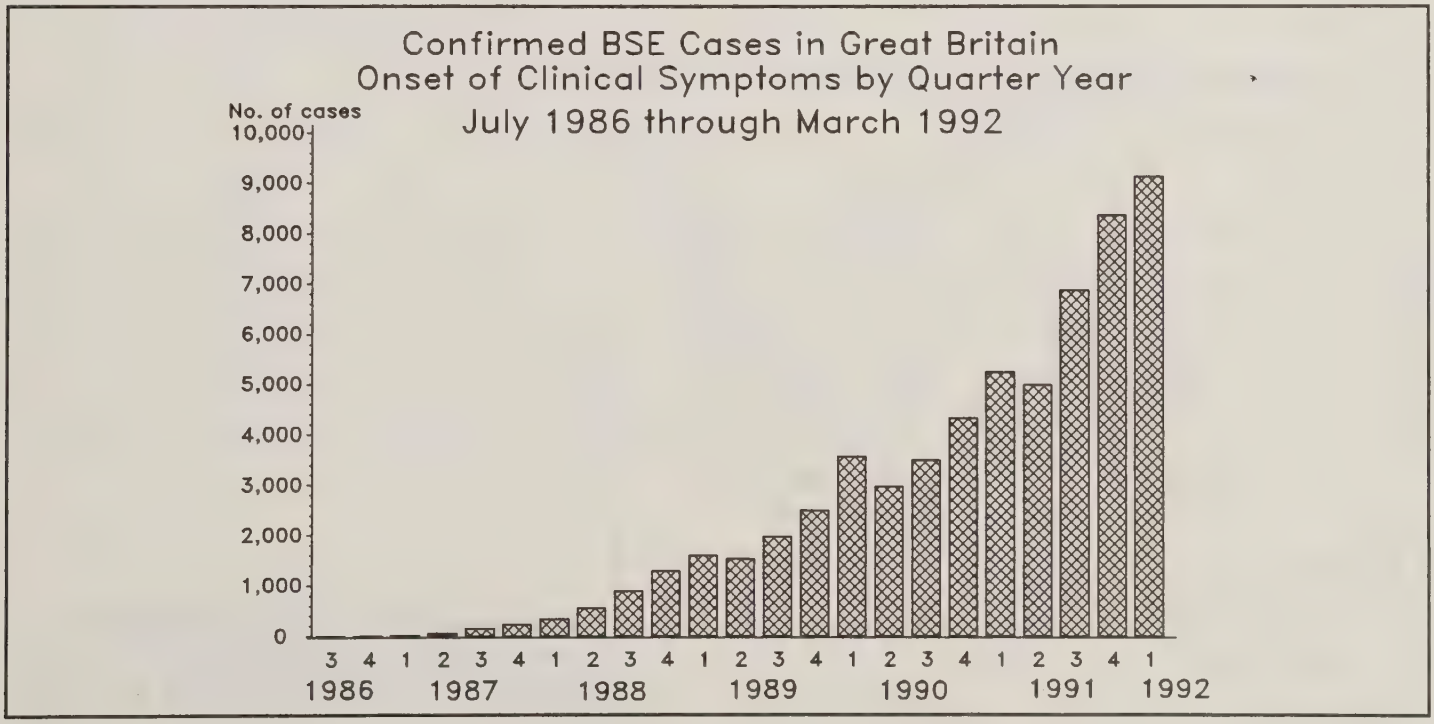


Figure 8

☐ Swine Brucellosis

Source: Dr. Delorias Lenard
USDA:APHIS:VS
Swine Health Staff
(301) 436-7767

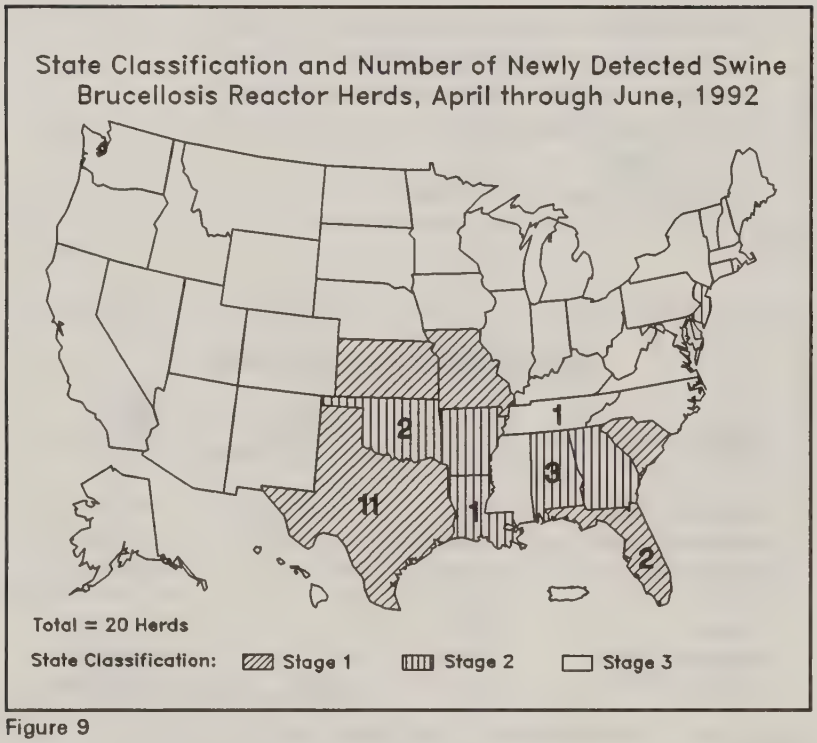


Figure 9

State Classifications:

Stage 1: Organization (surveillance and tracebacks begun)

Stage 2: ≥ 10% Surveillance/year; ≥ 80% of tracebacks successful

Stage 3: Validated Free (≥ 5% Surveillance/year; ≥ 80% of tracebacks successful)

Mississippi has advanced from Stage 2 to Stage 3 (Validated Free). The 20 swine herds found with brucellosis from April through June, 1992, were 11 fewer than found during the same period in 1991. The sources of infection for the 20 newly found infected herds included purchased swine (11), community spread (4), exposure to feral swine (1), and other/unknown (4).

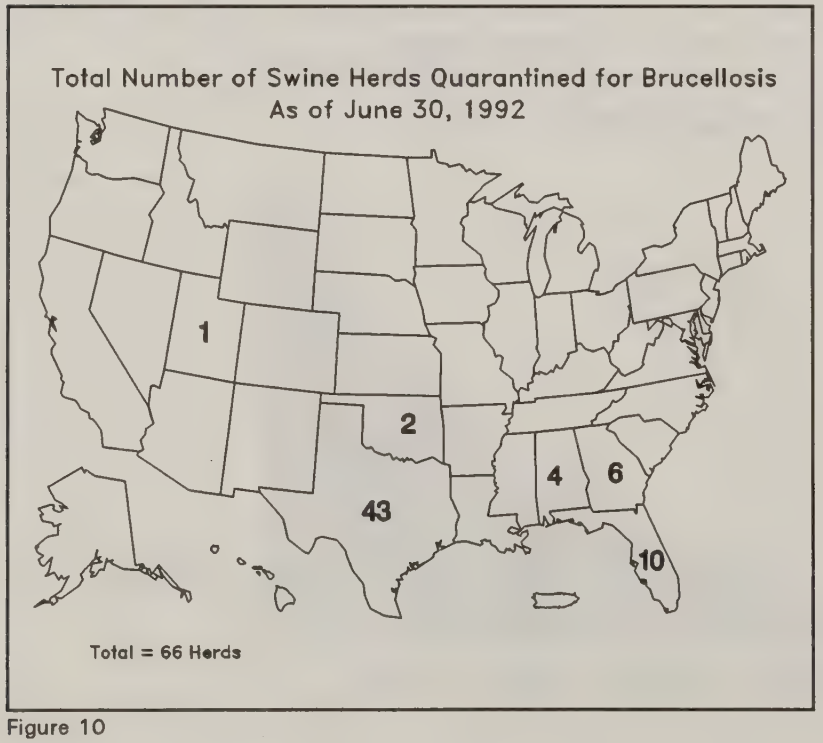


Figure 10

The total number of herds quarantined for swine brucellosis decreased from 77 to 66 from the end of June 1991 to the end of June 1992.

☐ Equine Viral Arteritis (EVA)

Criteria: Virus neutralization (>1:4 titer) and no history of vaccination, or, virus isolation (tissue or semen)

For all regions combined, only 94 positive tests for equine viral arteritis were reported for the second quarter of 1992 out of a total of 3,222 tests performed. Specimens from the Northeast (NE) region continued to have the highest percentage of positive tests, about 14 percent of all tests performed. Only 17 of 996 specimens from the Mideast (ME) and 21 of 1,302 specimens from the Pacific (PA) region were reported as positive for EVA during the quarter.

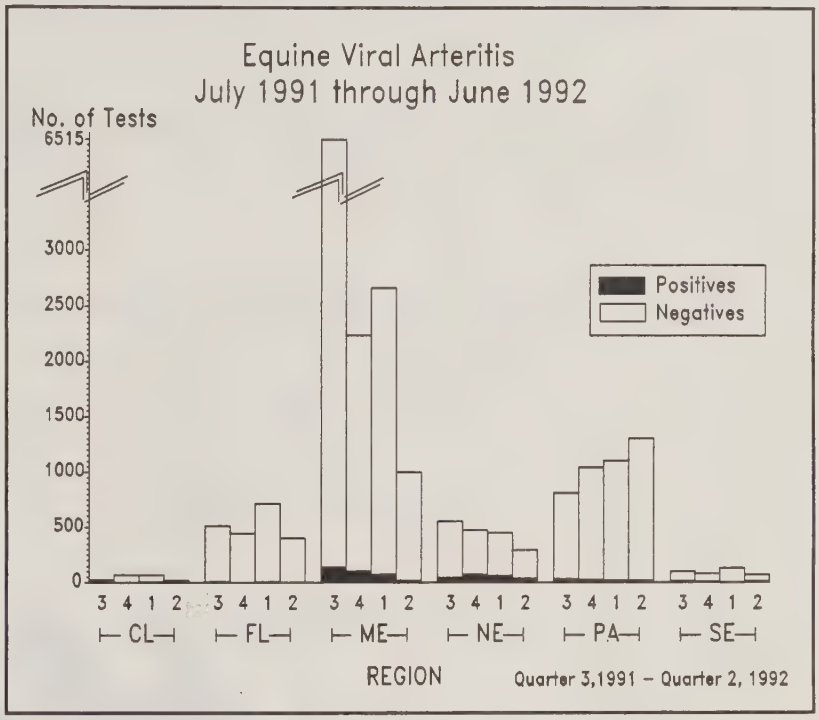


Figure 11

II. Etiologic Agents Associated with Calf Diarrhea

Section II characterizes agents most commonly associated with diarrhea in calves (8 weeks of age or less) from accessions reported to veterinary diagnostic laboratories.

Key to Figures in this Section:

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ME = Mideast	PR = Puerto Rico & U.S. Virgin Islands	

☐ VDLRS Data Review: Agents of Calf Diarrhea, July 1990 - June 1992

The Veterinary Diagnostic Laboratory Reporting System (VDLRS) has been collecting data on etiologic agents commonly associated with diarrhea in calves (8 weeks of age or less) since 1990. These agents include *Escherichia coli* (ECO), *Salmonella* spp. (SAL), coronavirus (COR), rotavirus (RTV), bovine viral diarrhea (BVD) virus, cryptosporidia (CRY), and coccidia (COC). A review of these diagnostic laboratory data was conducted to provide a descriptive overview of agents associated with specimens submitted from calves with diarrhea.

For this review, data were examined for July 1990 through June 1992. Positive tests for etiologic agents associated with calf diarrhea were reported by laboratories in 13 States (all of the States with a VDLRS laboratory except Ohio, Nebraska, and Texas). In total, data on calf specimen submissions from 34 States were reported to the VDLRS during the period reviewed.

While the numbers of positive tests reported by VDLRS participants do not indicate how many total calves had diarrhea associated with a given etiologic agent, the numbers should give a relative idea of which agents may have been most common. Using these data to make inferences about the relative frequency with which these etiologic agents occurred in submitted specimens does assume that any specimen examined for one potential etiologic agent was also examined for other agents. It is also assumed that the likelihood of a laboratory finding a given agent in a specimen is equal to the likelihood of finding any other agent in that specimen. These assumptions undoubtedly do not hold in all cases.

It should be recognized that some laboratories have an interest in, and do extra testing for, particular agents or diagnoses. Thus, a region in which a laboratory was doing special interest testing may have had relatively more positives reported for that agent of interest than a region without such a laboratory.

In addition, VDLRS laboratories may not be representative of all laboratories in the U.S. About two-thirds of all States do not have a laboratory currently participating in the VDLRS. It is interesting, however, to note that a significant proportion of all calves less than or equal to 8 weeks of age in the U.S. were located in areas represented by the data reported to the VDLRS over the 2-year period. The 13 States with laboratories reporting data had 14.4 million calves in their 1991 calf crops (National Agricultural Statistics Service, 1992). That was 37 percent of the total calf crop for the U.S. In addition, data were reported on calf specimens from 21 other States during the 2-year period. For calendar year 1991, the 34 States for which testing on at least one calf specimen was reported had 33.6 million calves or 86 percent of the U.S. calf crop.

The greatest caveat to interpreting diagnostic laboratory data is the fact that diagnostic specimens are never submitted to a laboratory for many cases of animal disease. Thus, caution must be used when attempting to extrapolate to the general population from data reported on laboratory specimens.

Overall Findings

VDLRS data show that, from July 1990 through June 1992, the agent most commonly found in specimens from diarrheic calves was cryptosporidia (Figure 12). During the period, 1,643 positive tests for cryptosporidia were reported, with *Escherichia coli* and rotavirus next with 1,494 and 1,492 positive tests, respectively. The least often found of the seven agents were coccidia (257) and BVD virus (398).

There was not a great difference in the relative frequency with which the various agents were found in

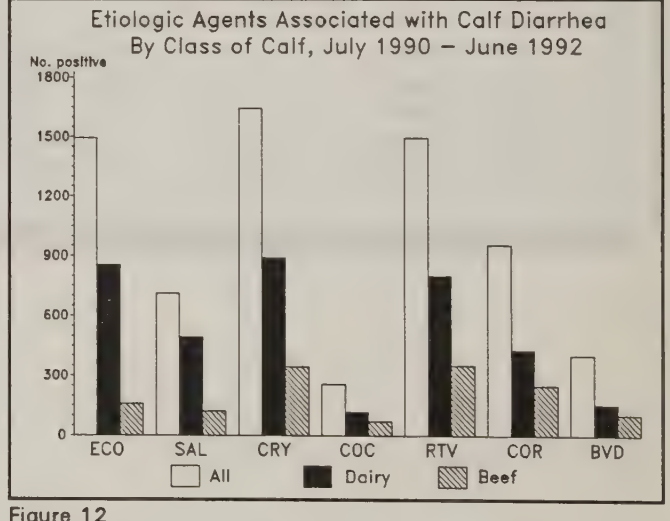


Figure 12

beef calf specimens as compared to dairy calf specimens, although positive tests for all seven of the agents were more often reported from dairy than from beef. The most common agents among beef calf specimens were rotavirus (350), cryptosporidia (345), and coronavirus (250), while among dairy calves the three most common agents were cryptosporidia (890), *E. coli* (853), and rotavirus (797).

Patterns by Region

There were differences between the various regions of the U.S. as to the most commonly found agents (Figures 13 and 14). While calf specimens from the Central (CL) and North-Central (NC) regions most often had cryptosporidia detected (26% and 30% of all agents found, respectively), those from the Mideast (ME) and Northeast (NE) had *E. coli* detected more often than any of the other agents. In fact, of the 758 tests which were positive for a diarrheal agent in specimens from NE region calves, 72 percent (546) were *E. coli*. Specimens from Florida (FL), the Southeast (SE), and Pacific (PA) regions had rotavirus reported most often (33%, 37%, and 28% of all agents found, respectively). In the Mountain (MN) region, coronavirus was the agent found most commonly (47% of all positive tests). Coronavirus was also the second most commonly reported agent from calf specimens from the FL and SE regions.

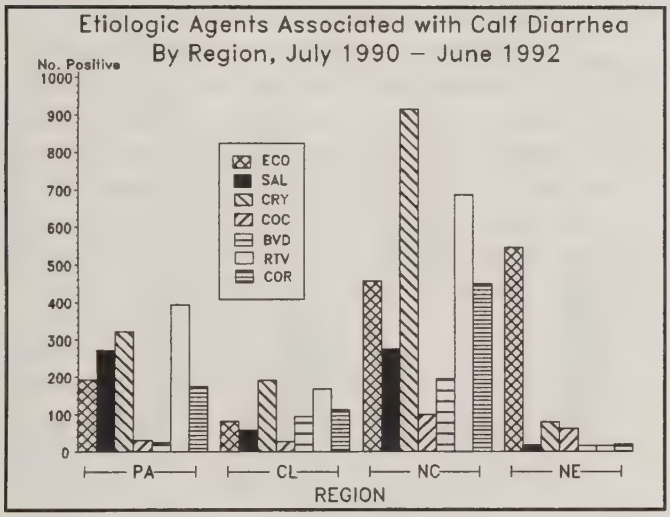


Figure 13

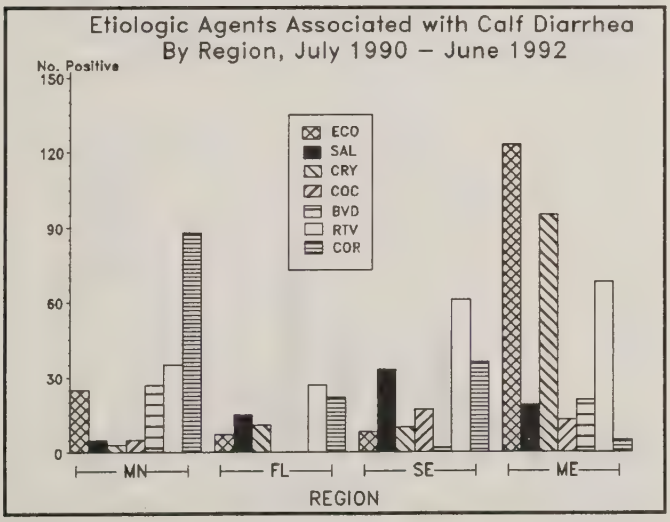


Figure 14

Patterns by Region and Class of Calf

Figures 15 and 16 show the regional totals of positive tests for each of the seven agents which could be identified as coming from beef calves specimens. Although BVD virus was only the sixth most common agent reported among all beef calf specimens (105/1,400 or 8% of all positives), in the MN region it accounted for 13 percent (18/137) of all the positive tests reported. Thus, BVD was the fourth most commonly reported agent in beef calf specimens from that region.

The most commonly found agent in beef calf specimens from the MN region was coronavirus (65/137; 47%), and the most common from CL region beef calf specimens was cryptosporidia (69/219, 32%). Cryptosporidia was also the most commonly found

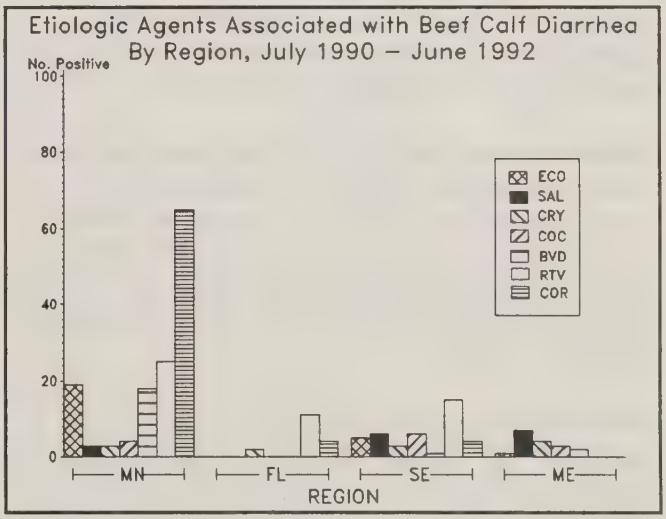


Figure 15

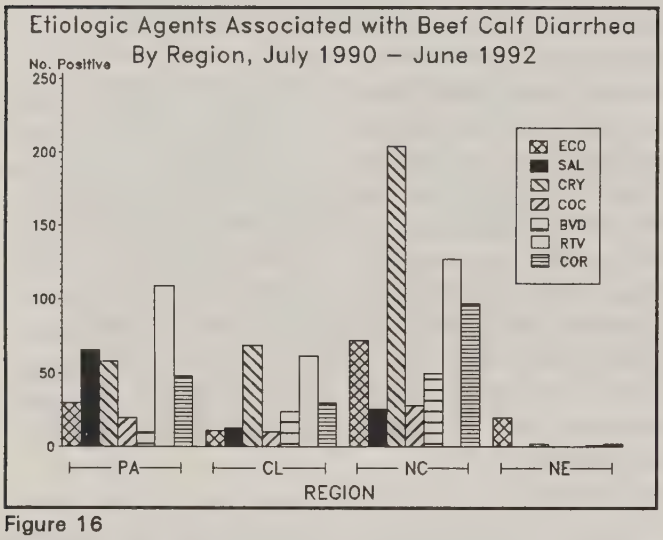


Figure 16

agent in beef calf specimens from the NC region (204/604 or 34% of all agents found).

Among all beef calf specimens, *Salmonella* was only the fifth most commonly reported agent with 121 (9%) of the 1,400 positive tests; however, *Salmonella* spp. represented 19 percent (66/341) of all positive tests of beef calf specimens from the PA region. From the ME region, 41 percent (7/17) of beef calf agents were reported to have been *Salmonella* spp.

Compared with other regions, *E. coli* made up an unusually high proportion of beef calf agents found in the NE. *E. coli* comprised 80 percent (20/25) of such agents in the NE, versus 11 percent (158/1,400) in all regions.

Coccidia was the rarest agent among beef calf specimens (71/1,400; 5%). Compared to other regions, the SE had the largest proportion of beef calf agents found to be coccidia (15%; 6/40).

Although coccidia was also the least found agent in dairy calf specimens (118/3,730; 3%), it made up 9 percent (58/682) of all dairy calf agents reported for the NE region (Figure 17). *E. coli* was the most commonly reported agent in dairy calf specimens from that region, with 485 of 682 (71%) agents reported to have been *E. coli*.

The SE region had the highest percentage of *Salmonella* spp. found among dairy calf specimens for any region (Figure 18). Of 99 agents found in such specimens from the SE, 26 percent (26) were *Salmonella*. Rotavirus was the most common agent found in dairy calf specimens from the SE (39/99).

Similar to the findings for beef calf specimens from the CL region, BVD virus made up an unusually high percentage of agents found in dairy calf specimens from that region. BVD virus was the third most common agent among dairy calf specimens in the CL region with 15 percent of all agents reported.

Dairy calf specimens from the FL region had two agents found in higher proportions than the average for all regions. Coronavirus was reported in 28 percent of all positive tests and *Salmonella* spp. made up 23 percent of all positives. For dairy calf specimens from all regions, those two agents made up only 11 and 13 percent, respectively, of all agents.

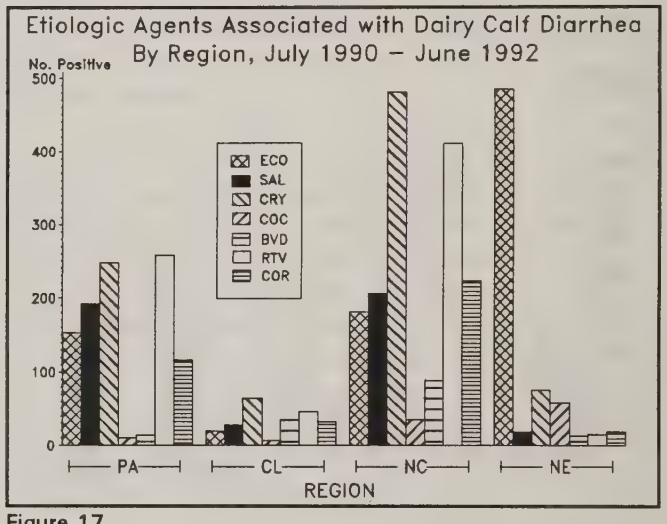


Figure 17

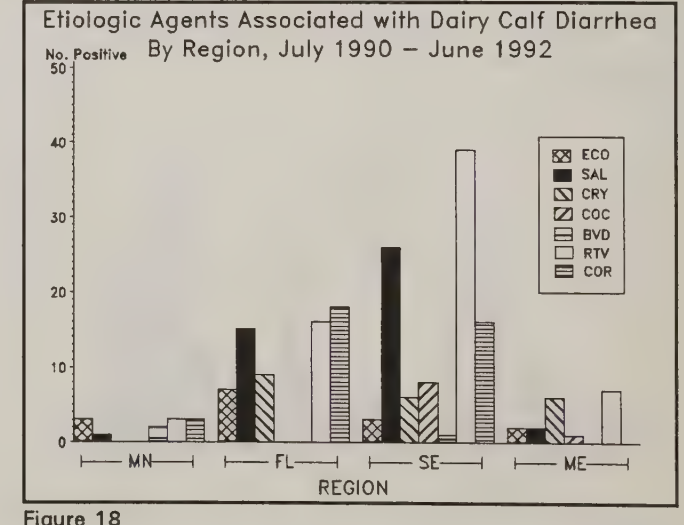


Figure 18

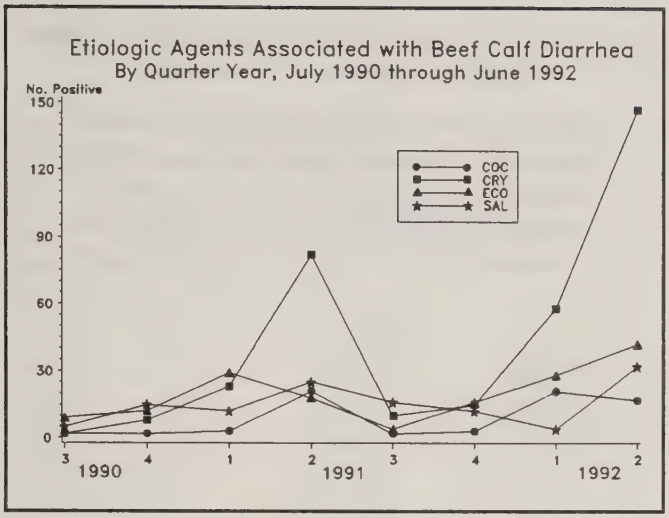


Figure 19

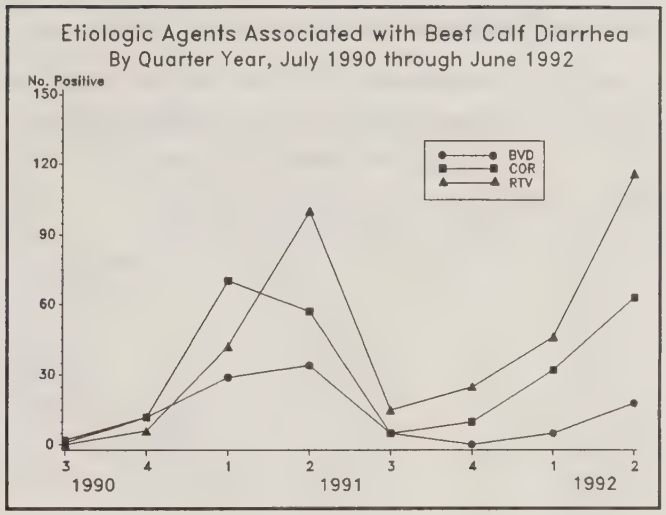


Figure 20

Patterns by Quarter Year

Among beef calf specimens (Figures 19 and 20), cryptosporidia was relatively more common in the second quarter of each year. In fact, by comparing the numbers from Figure 19 to those of Figure 20 (both drawn to the same scale), it can be observed that cryptosporidia were much like rotavirus and coronavirus in that they were relatively more common among beef calf specimens during the second quarter of both 1991 and 1992. The higher numbers of agents found in beef calf specimens during the second quarter of the year is probably due to the fact that the second quarter is usually calving season, thus more calf specimens are tested and more agents are likely to be found. A relatively low number of all agents was reported for both the third quarter of 1990 and 1991. This is probably because by the third quarter of any year most beef calves exceed the 8 week age limit for reporting to the VDLRS.

Among dairy calf specimens (Figures 21 and 22), the relative numbers of agents have been lowest in the second or third quarter of each year. Relative peaks have occurred in the first quarter for cryptosporidia, rotavirus, and coronavirus. Similar peaks have occurred for *E. coli* in the fourth quarter of the last two years. *Salmonella* spp. may have a relative peak in the third quarter of each year, although more data need to be collected to confirm such a pattern.

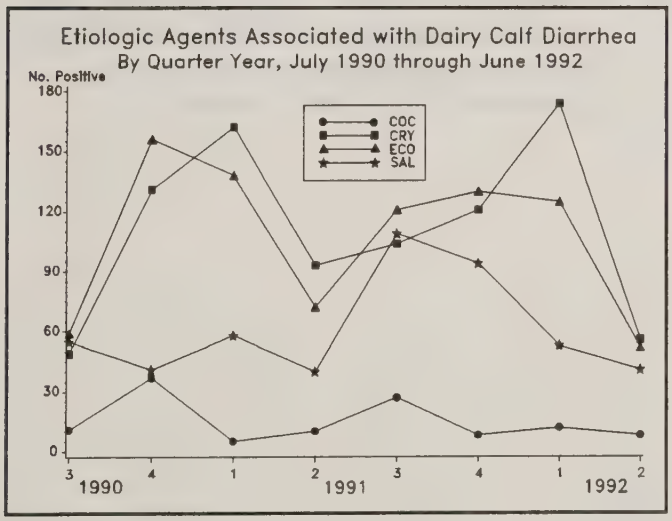


Figure 21

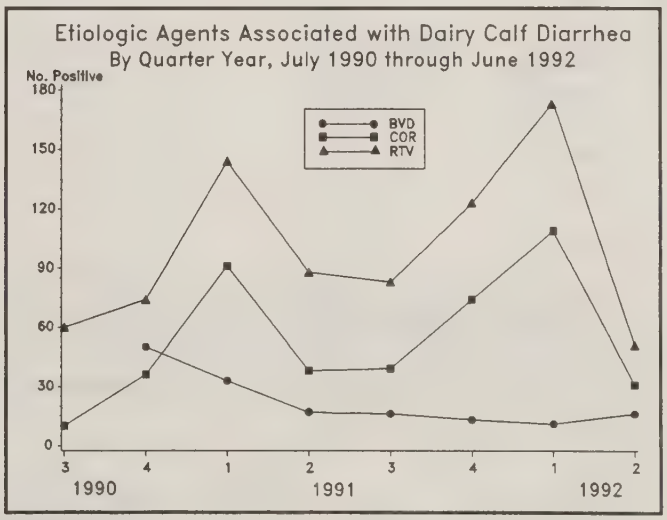


Figure 22

☐ *Campylobacter* spp.

Criterion: Culture

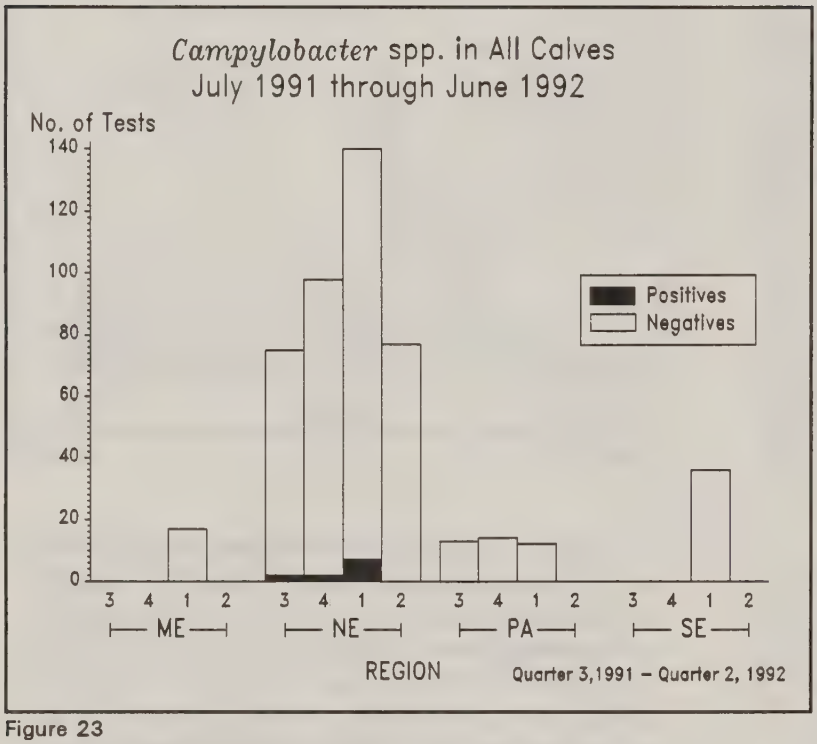


Figure 23

In the last four quarters only 12 of 496 calf specimens reported tested for *Campylobacter* spp. have been positive. For the second quarter of 1992, there were no positive tests reported.

☐ *Clostridium perfringens* Type C

Criteria: Gross and histopathologic exam

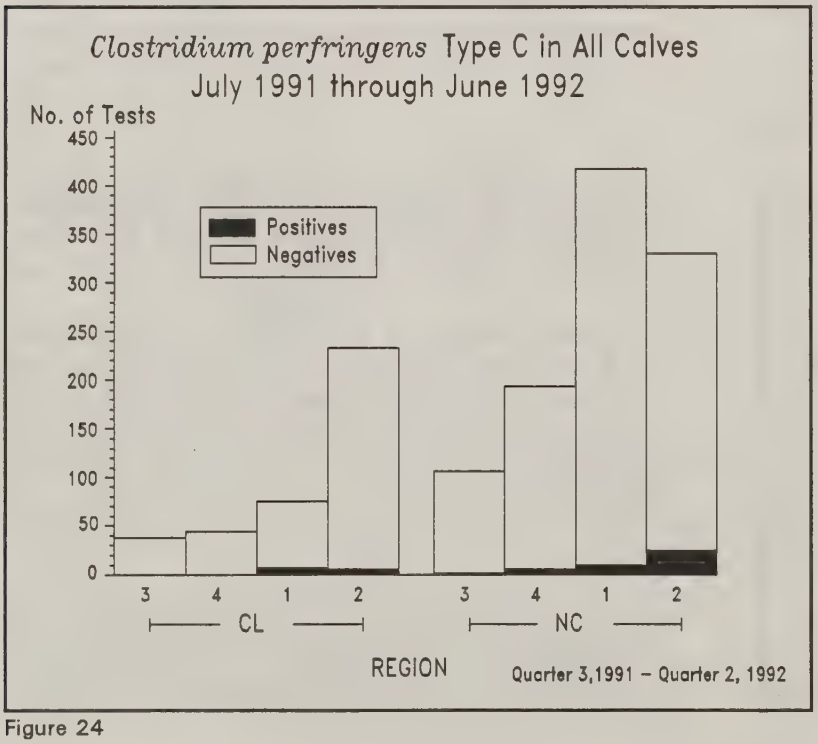


Figure 24

Only the Central (CL) and North-Central (NC) regions had more than four calf specimens reported to have been tested for *Clostridium perfringens* type C during the second quarter of 1992. Twenty-five of the 330 specimens tested from the NC region were found positive, while beef calf specimens from that region were positive on 11 of 14 tests reported.

☐ *Escherichia coli*

Criteria: Culture from intestine and demonstration of at least one virulence characteristic such as: adhesive antigens (K99), bacterial adherence, or enterotoxin

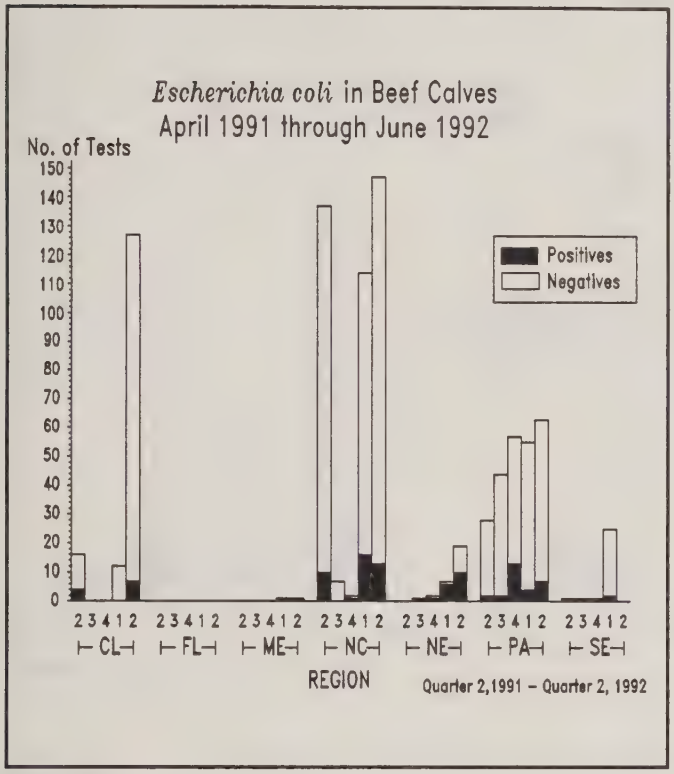


Figure 25

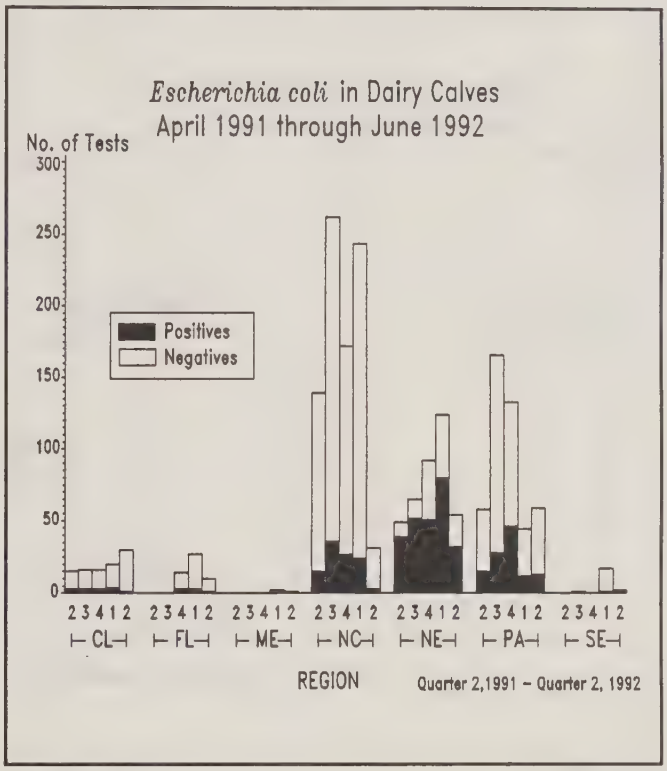


Figure 26

More positive tests for *E. coli* were reported for dairy calf specimens tested in the second quarter of 1992 than for beef calf specimens (52 vs. 42), although almost twice as many beef calf specimens were tested (361 vs. 187). With the exception of the Northeast (NE) region, the total number of calf specimens reported positive for *E. coli* during the second quarter of 1992 was approximately equal to the number positive in the previous quarter.

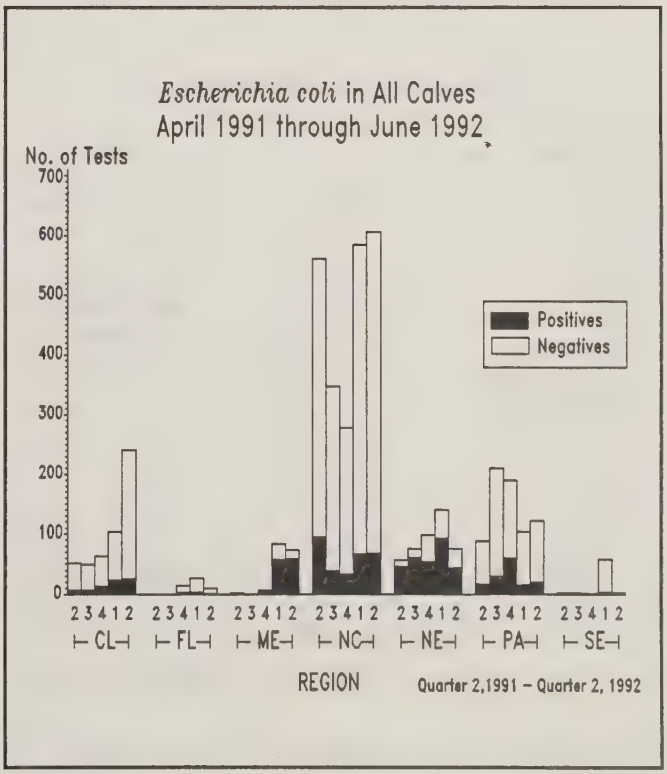


Figure 27

☐ *Salmonella* spp.

Criterion: Culture (serotype identification encouraged)

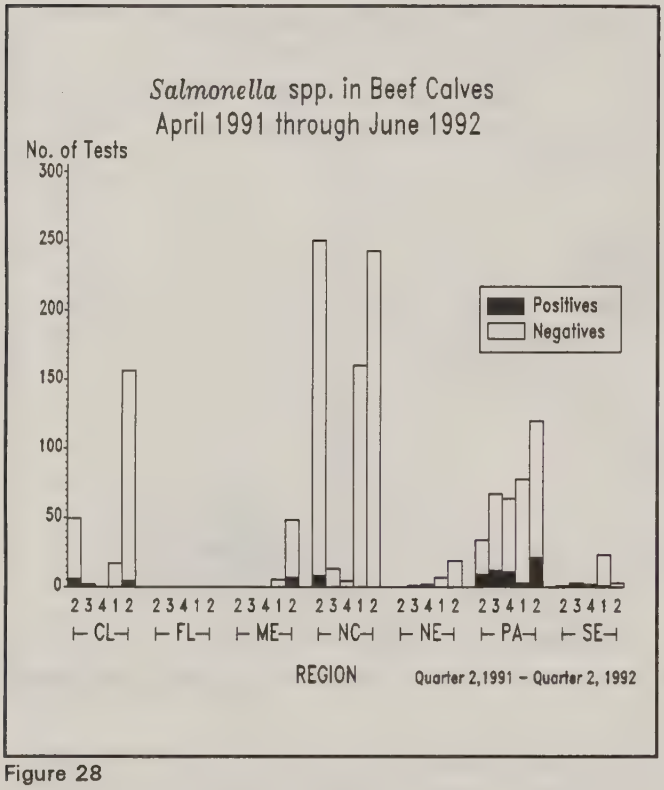


Figure 28

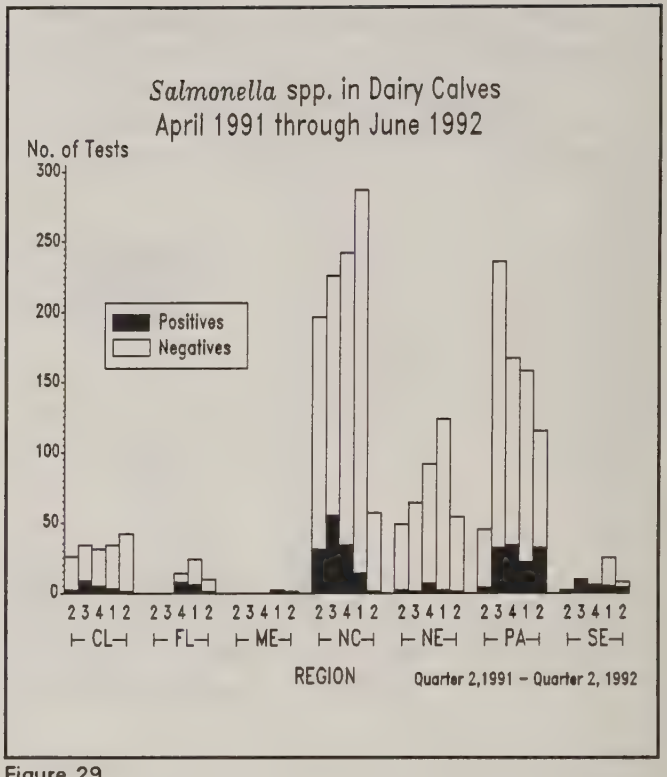


Figure 29

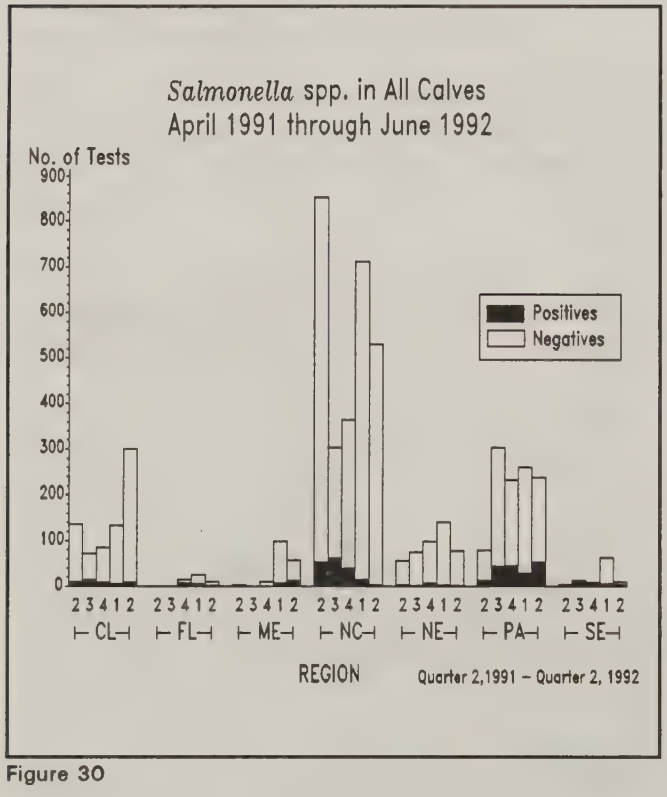


Figure 30

Specimens from the Pacific (PA) region were found positive for *Salmonella* spp. more frequently than those from other regions of the U.S. during the second quarter of 1992. This was true for both dairy and beef calf specimens, but was most pronounced for dairy. Of 115 dairy calf specimens tested from the PA region, 32 were positive. Only 9 of 172 dairy specimens from other regions of the U.S. were reported to have been positive. While the total number of *Salmonella*-positive tests increased among calf specimens from the PA region as compared to last quarter (53 vs. 29), the number of positives from all other regions decreased (30 vs. 41).

☐ Bovine Viral Diarrhea (BVD)

Criteria: Virus isolation, or, positive FA (any tissue) with histologic lesions

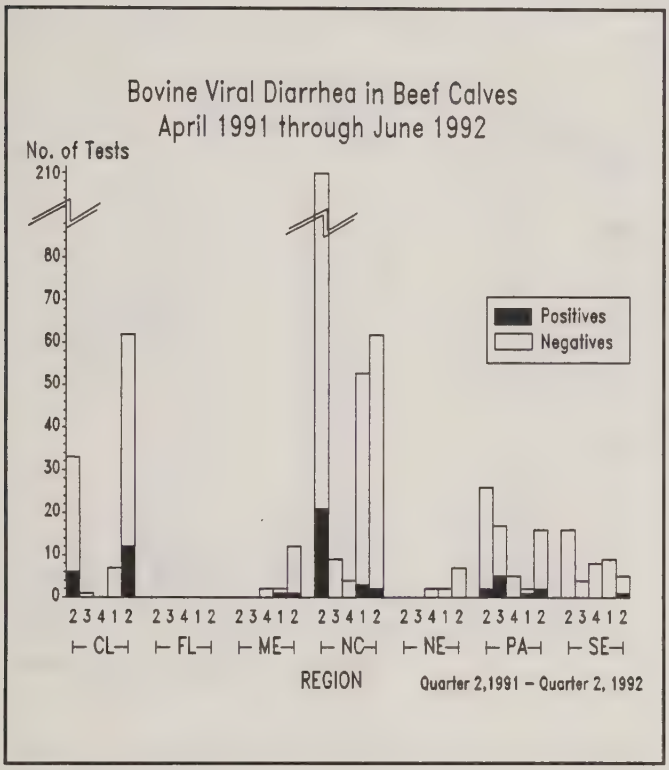


Figure 31

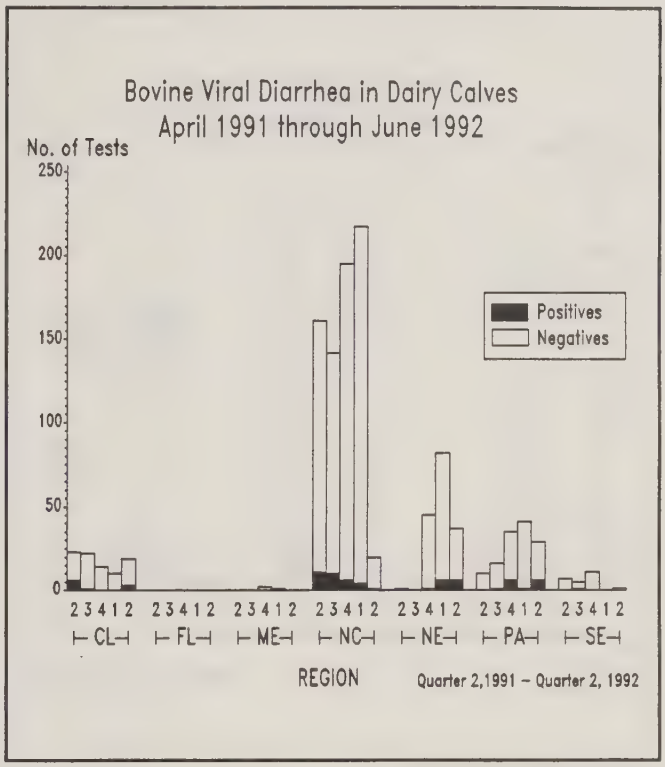


Figure 32

The total number of positive tests for BVD more than doubled from the first to the second quarter of 1992 (27 vs. 59), although fewer total tests were reportedly performed. Fewer positive tests for BVD were reported for the second quarter of 1992 than for the same period in 1991 (59 vs. 79). This was due primarily to the smaller number of positive tests reported for specimens from the North-Central (NC) region, particularly for beef specimens (2 vs. 21).

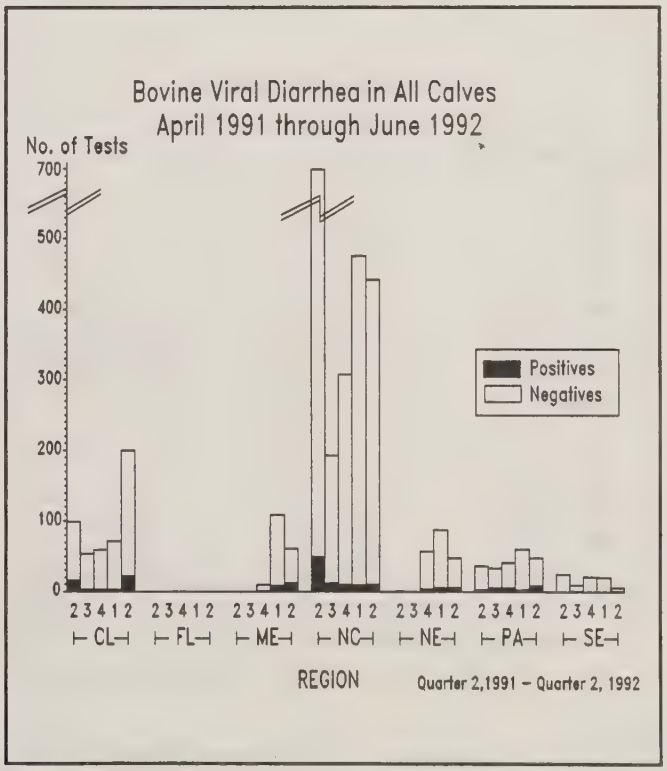


Figure 33

☐ Coronavirus

Criteria: Antigen by FA or ELISA, or, electron microscopy of feces/intestinal contents

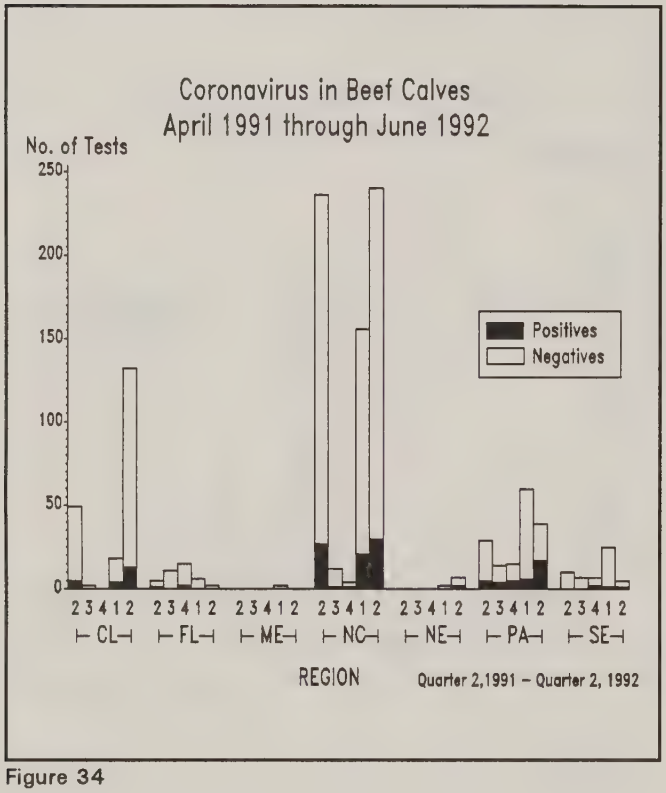


Figure 34

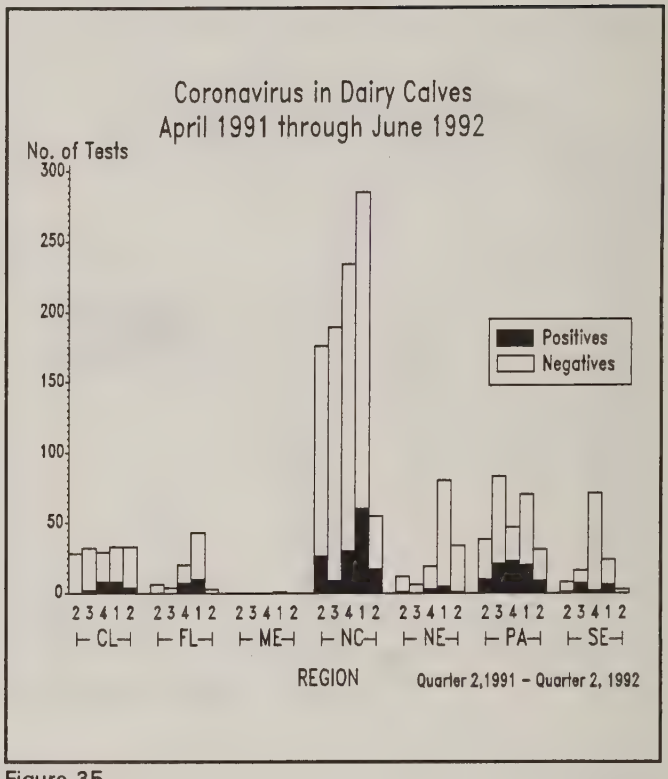


Figure 35

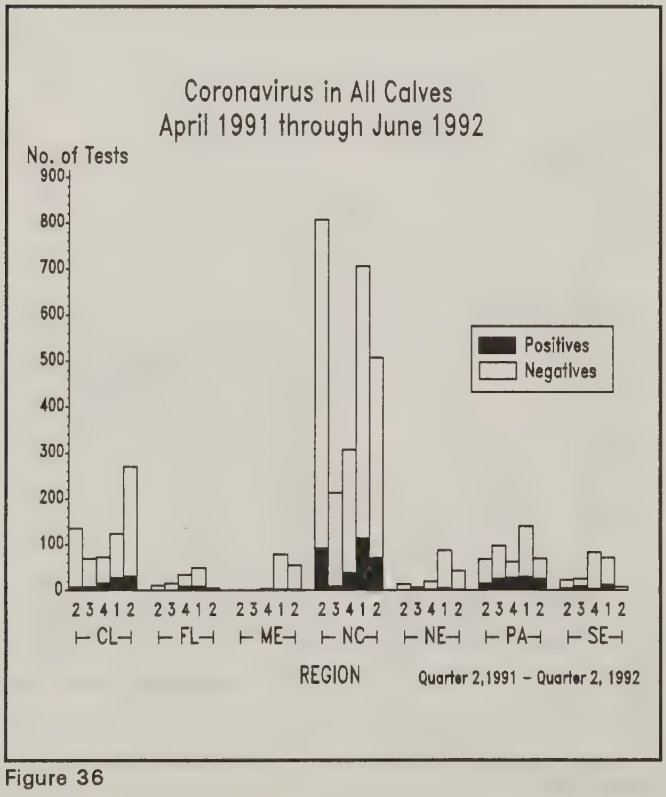


Figure 36

The number of positive tests for coronavirus from beef calf specimens was up from last quarter (63 vs. 32), while the number from dairy calf specimens was down compared to last quarter (31 vs. 109). There was an equal or greater number of beef calf specimens reported positive for coronavirus in every region of the U.S. as compared to last quarter. Conversely, there was an equal or lesser number of dairy calf specimens reported positive in every region as compared to last quarter. These seasonal patterns are similar to what has been reported for coronavirus and other calf diarrheal agents over the last 2 years (see discussion on page 15).

☐ Rotavirus

Criteria: Antigen by FA or ELISA, or, electron microscopy of feces/intestinal contents

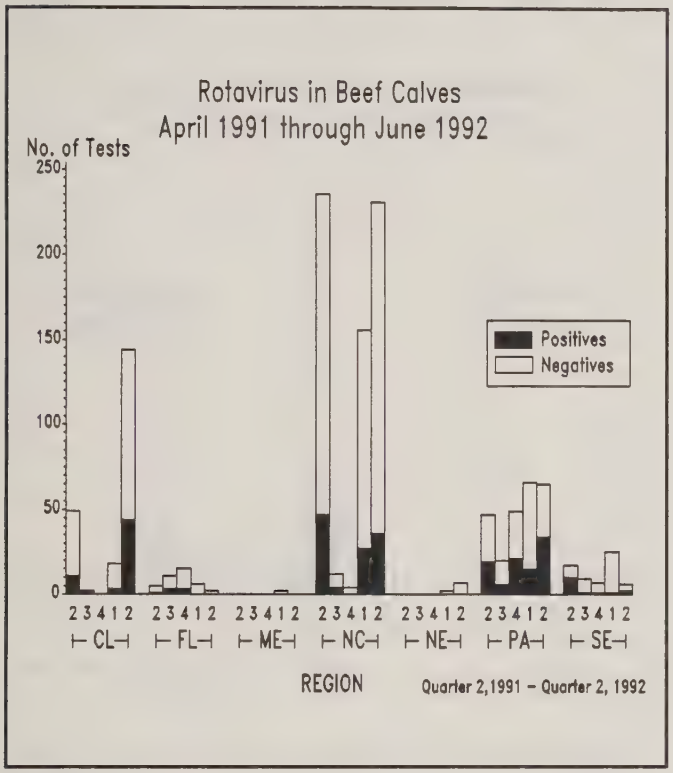


Figure 37

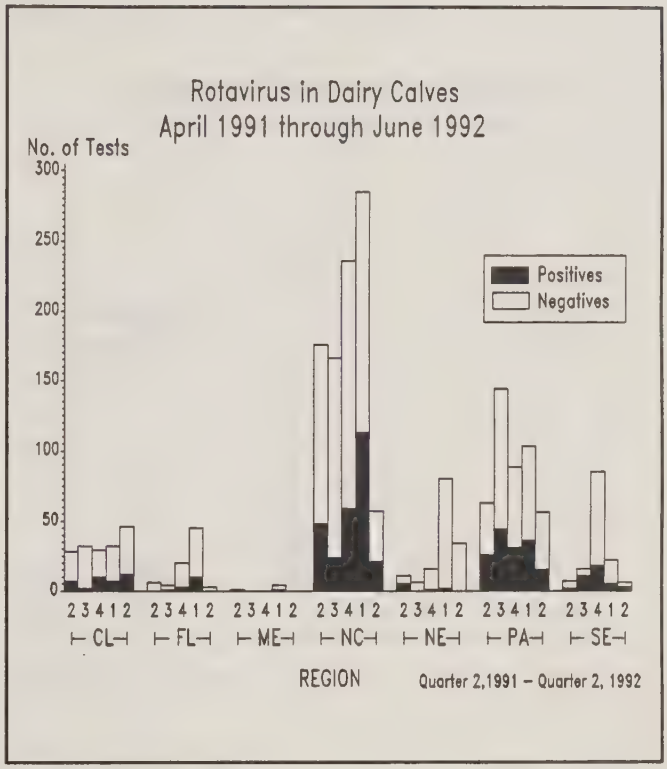


Figure 38

Similar to coronavirus, the second quarter of 1992 had more positives tests reported for rotavirus in beef calf specimens than did the first quarter (116 vs. 46). There were fewer positive tests for rotavirus reported from dairy calf specimens than during last quarter (51 vs. 174). All but 35 of the 271 total positive tests for rotavirus reported for the second quarter were from the Central (CL), North-Central (NC), or Pacific (PA) regions.

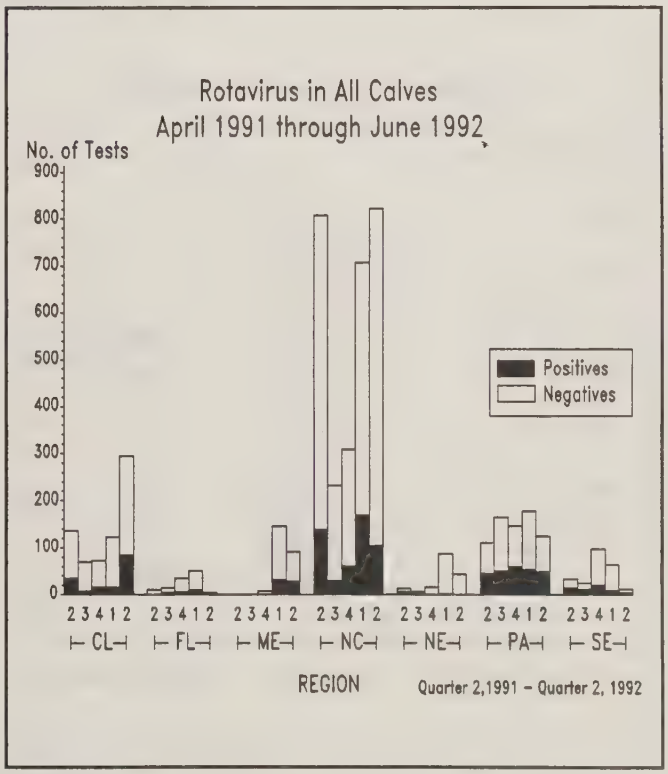


Figure 39

☐ Cryptosporidia Parasitism

Criteria: Parasitologic or histopathologic exam

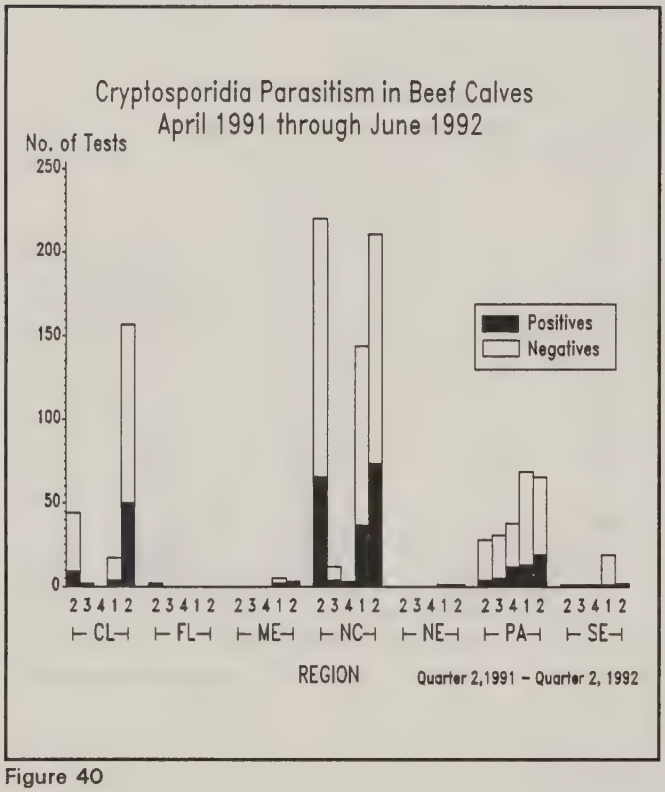


Figure 40

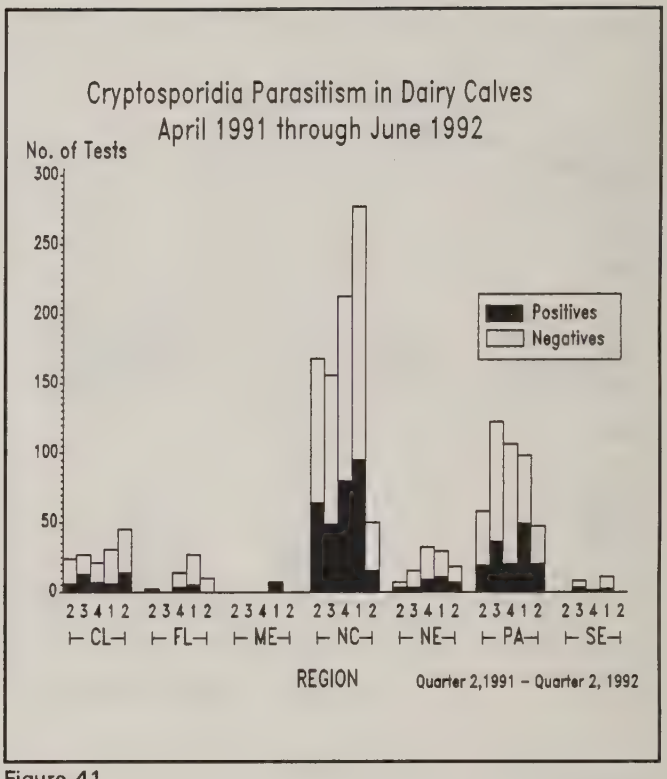


Figure 41

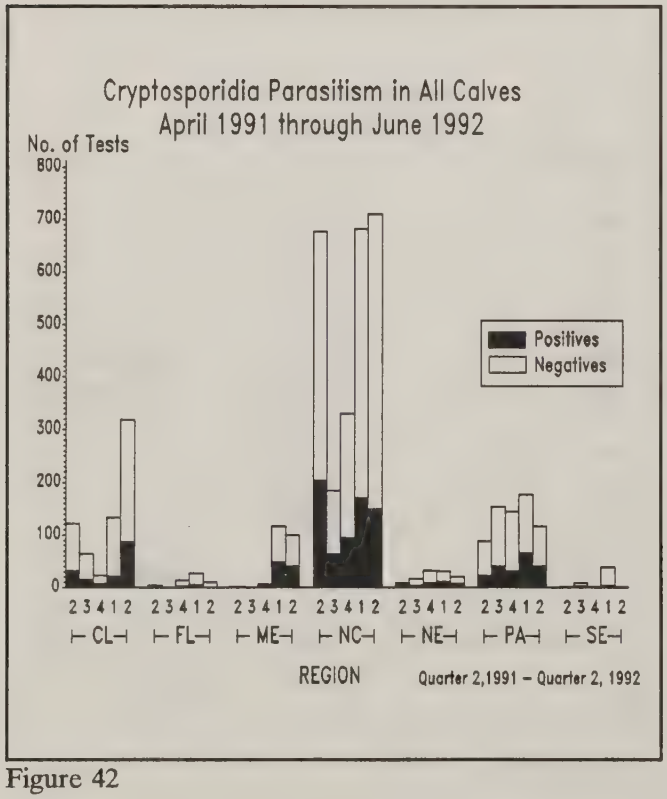


Figure 42

Much as for coronavirus and rotavirus, there were more positive tests for cryptosporidia parasitism from beef calf specimens reported for the second quarter of 1992 than for the first quarter (147 vs. 58) and there were fewer positive tests reported from dairy calf specimens than during the previous quarter (56 vs. 174).

☐ Coccidia Parasitism

Criteria: Parasitologic or histopathologic exam

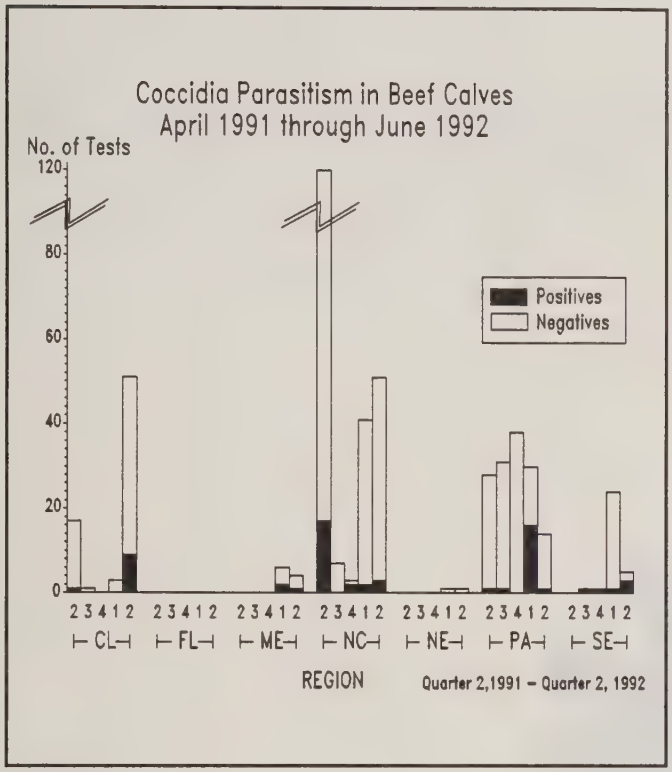


Figure 43

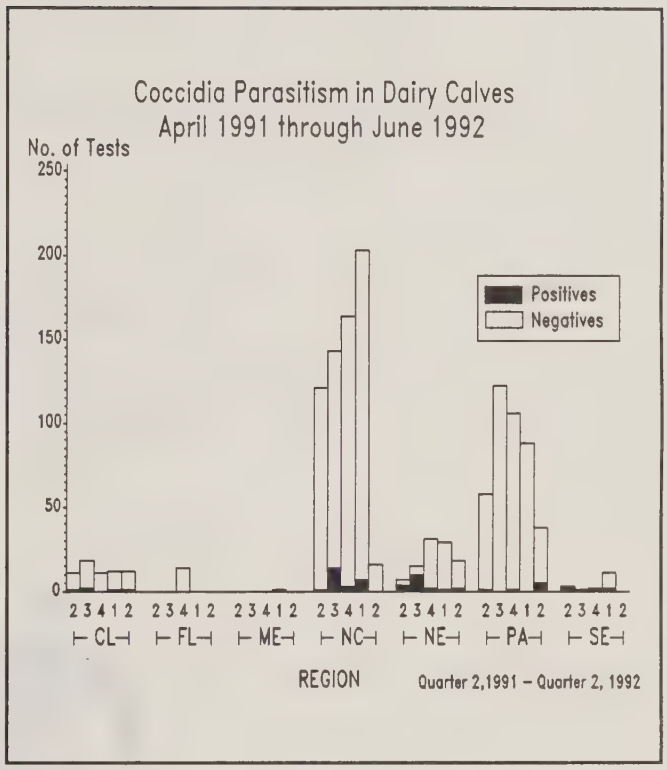


Figure 44

Overall, the number of positive tests for coccidia parasitism reported from calf specimens for the second quarter of 1992 was the same as for the previous quarter (46). More positive tests were reported from beef calf specimens than from dairy calf specimens (17 vs. 8).

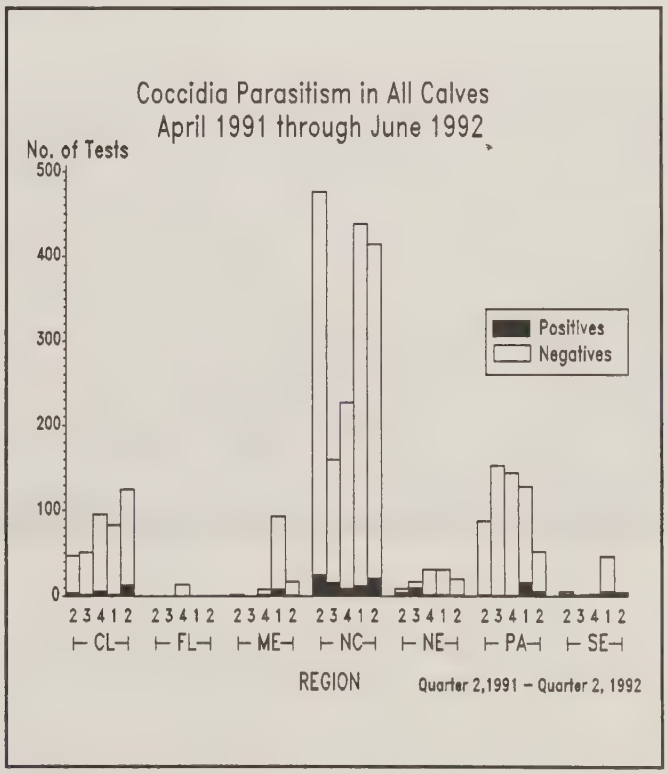


Figure 45

III. Etiologic Agents Associated with Piglet Diarrhea

Section III characterizes agents most commonly associated with diarrhea in piglets (8 weeks of age or less) from accessions reported to veterinary diagnostic laboratories.

Key to Figures in this Section:

- In some cases, the reported number of negative tests performed is a minimum because some laboratories were not able to determine the total number of negative tests performed.
- Data are presented by region of specimen origin and quarter year of specimen submission.
- Abbreviations for regions used in the figures are:

AK = Alaska	MN = Mountain	SC = South-Central
CL = Central	NC = North-Central	SE = Southeast
FL = Florida	NE = Northeast	SW = Southwest
HI = Hawaii	PA = Pacific	UNK = Unknown
ME = Mideast	PR = Puerto Rico & U.S. Virgin Islands	

☐ *Clostridium perfringens* Type C

Criteria: Gross and histopathologic exam

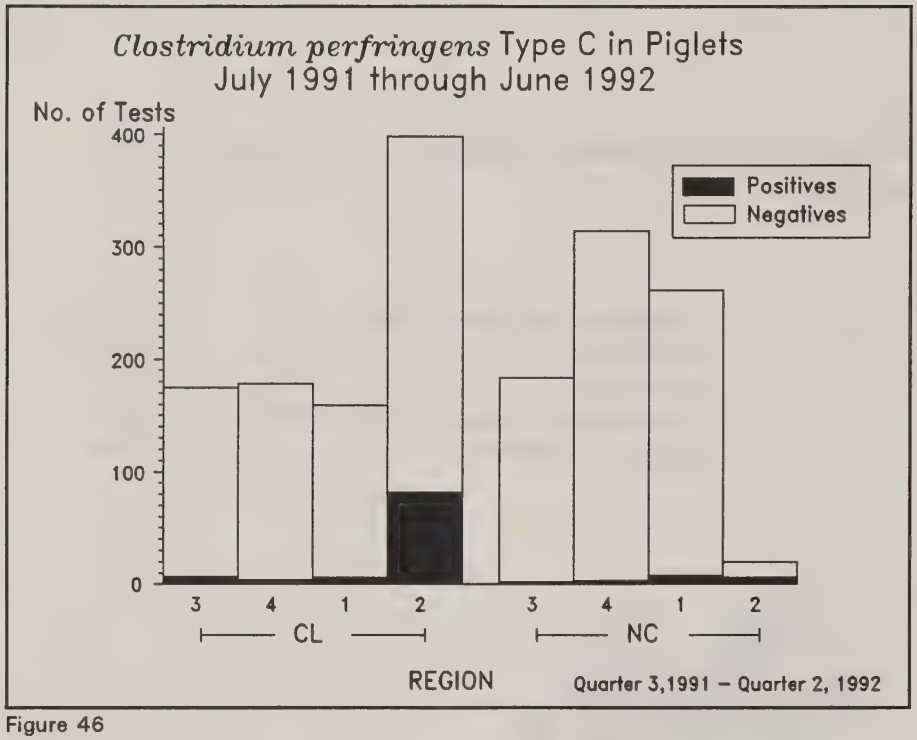


Figure 46

As in previous quarters, the only piglet specimens reported to have been tested for *Clostridium perfringens* type C during the second quarter of 1992 were from the Central (CL) and North-Central (NC) region. This was the first quarter that any region had more than eight tests reported positive.

☐ *Escherichia coli*

Criteria: Culture from intestine and demonstration of at least one virulence characteristic such as: adhesive antigens (K99), bacterial adherence, or enterotoxin

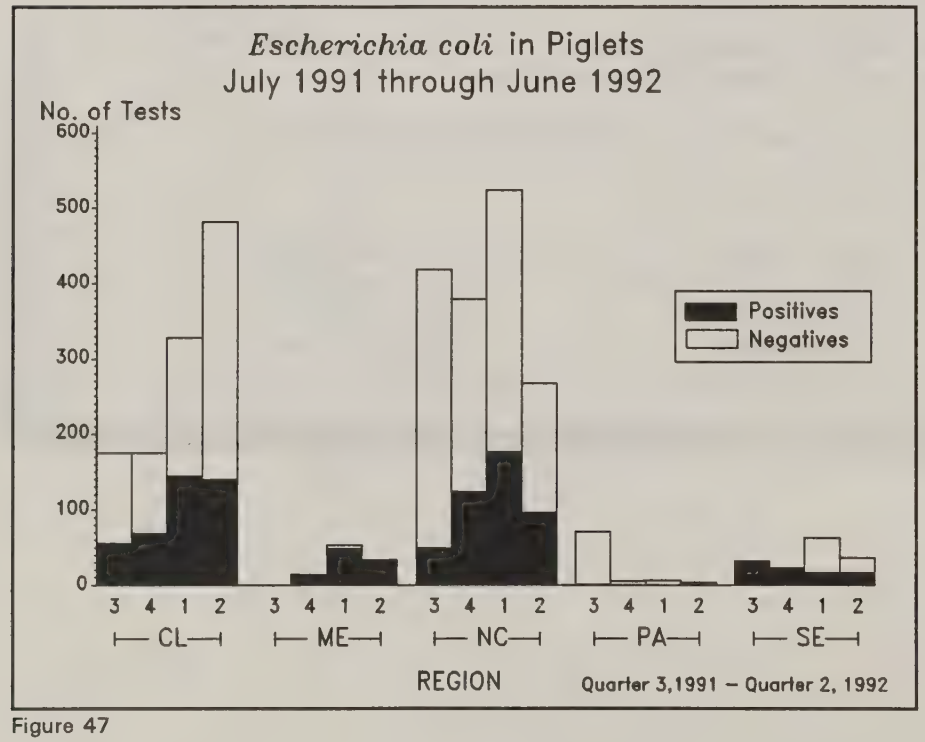


Figure 47

For the fourth quarter in a row, the Central (CL) and North-Central (NC) regions had the most piglet specimens reported positive for *E. coli* during the second quarter of 1992. Those two regions also had the most total specimens tested for the agent.

☐ Rotavirus

Criteria: Antigen by FA or ELISA, or, electron microscopy of feces/intestinal contents

The only region with more piglet specimens reported to have been tested for rotavirus in the second quarter of 1992 than in the previous quarter was the Central (CL). That was also the only region to have more specimens (105) reported as positive for rotavirus than in the previous quarter.

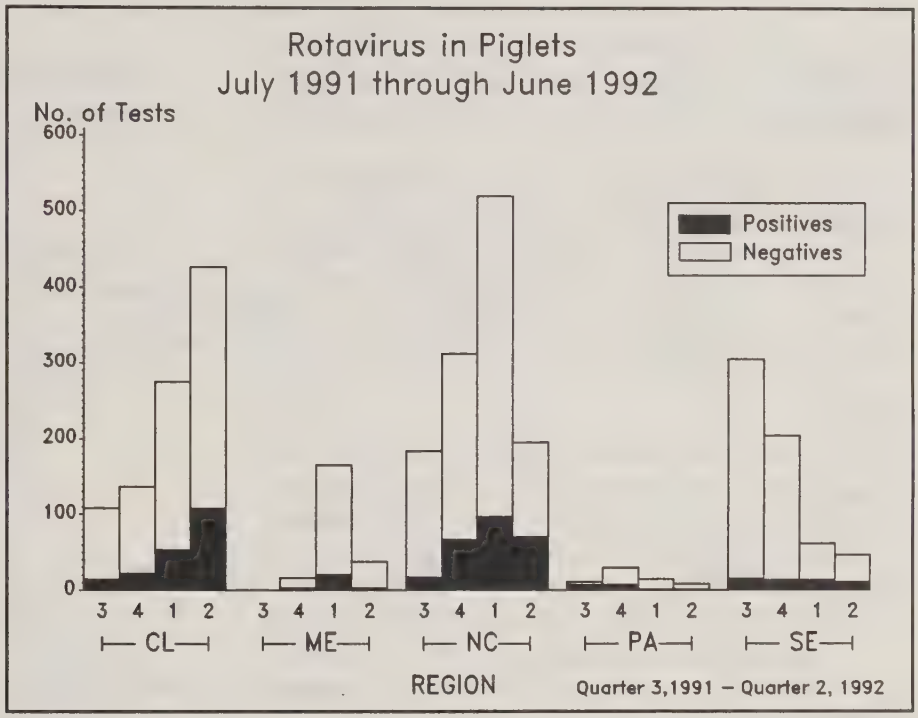


Figure 48

☐ Transmissible Gastroenteritis (TGE)

Criteria: Antigen by FA, or, electron microscopy

Despite an increased number of piglet specimens from the Central (CL) region reported to have been tested for transmissible gastroenteritis (TGE), fewer positive tests were reported for that region. From all regions, only 65 positive tests were reported for TGE as compared to 146 for the first quarter of 1992.

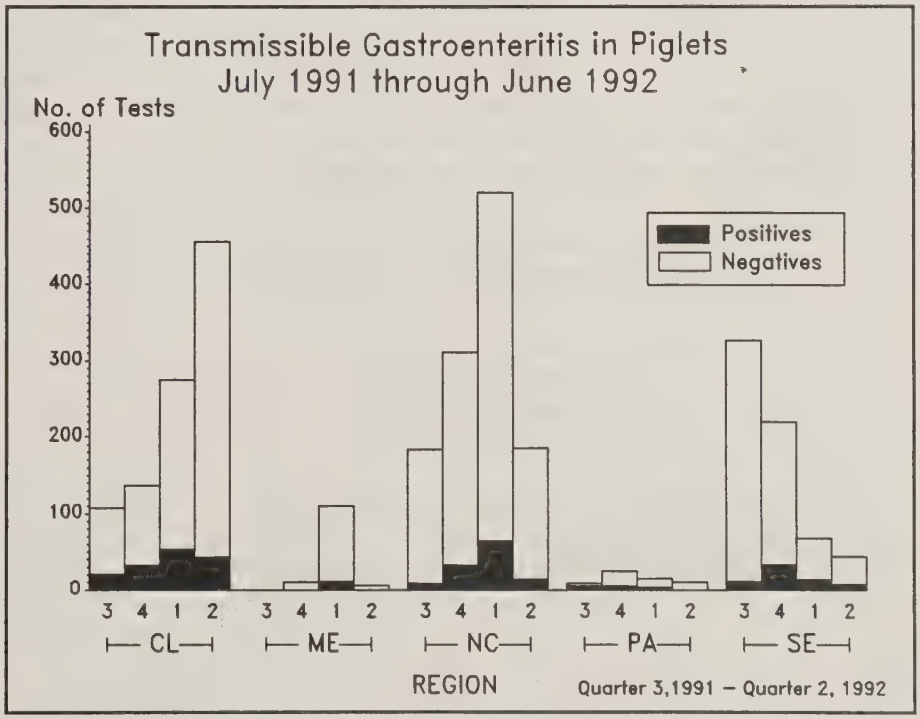


Figure 49

☐ Coccidia Parasitism

Criteria: Parasitologic or histopathologic exam

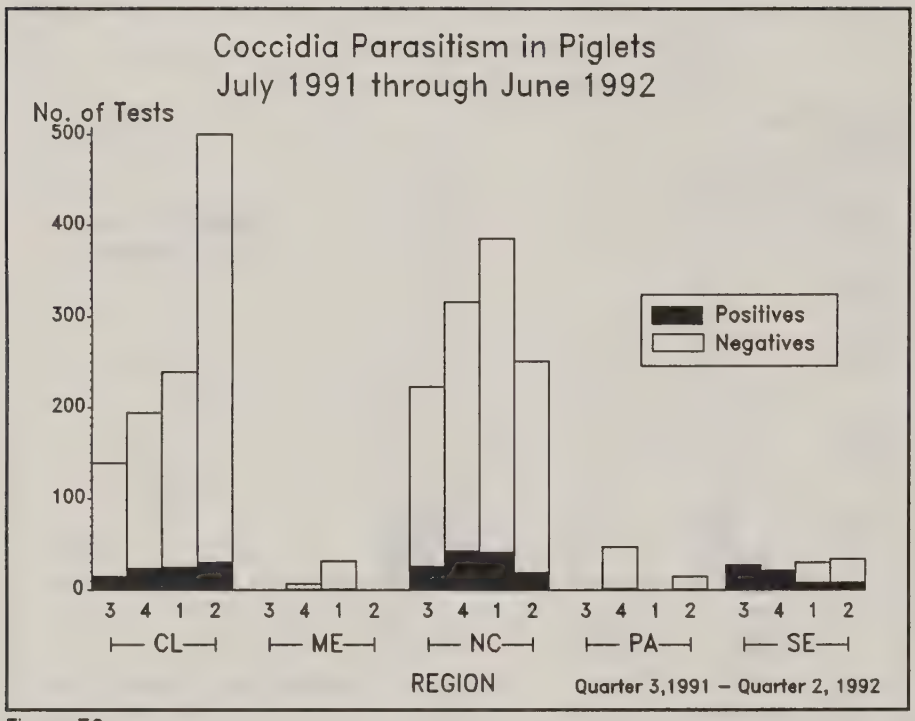


Figure 50

Although there were many more piglet specimens from the Central (CL) region reported to have been tested for coccidia during the second quarter of 1992 than during the previous quarter (500 vs. 239), there were only 5 more tests positive (30 vs. 25). For all regions combined, only 59 positive tests were reported for the second quarter as compared to 75 for the first quarter of 1992.

DxNEWS

This section contains news items and articles of potential interest to diagnostic laboratories. Submissions from nonparticipating laboratories are welcome.

Planning Committee of the Veterinary Diagnostic Laboratory Reporting System Will Meet in Louisville

A meeting of the Planning Committee for the Veterinary Diagnostic Laboratory Reporting System (VDLRS) has been scheduled in conjunction with the annual meeting of the American Association of Veterinary Laboratory Diagnosticians (AAVLD) in Louisville, Kentucky. The meeting is planned for:

Saturday, October 31, 1992
9 a.m. - Liverpool Room (south end)
Galt House Hotel
Louisville, Kentucky

Anyone interested in the future of the DxMONITOR Animal Health Report and the Veterinary Diagnostic Laboratory Reporting System should plan to attend. The tentative agenda for the meeting is presented below.

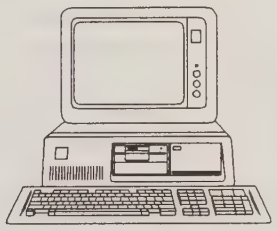
VDLRS Planning Committee Meeting

Time	Topic
9:00	Welcome and introductions
9:05	Progress of past year and status of 1992 goals
9:15	Review of current diseases diagnoses/agents
9:35	New diagnoses/agents to be reported
9:55	Data capture: difficulties and remedies
10:20	BREAK
10:35	Data transfer / DxMONITOR Data Submission System
10:50	Format of DxMONITOR
11:15	Goals for 1993
11:40	Selection of 1993 Editorial Board
11:50	Open discussion / questions
12:00	Adjourn

DxMONITOR Data Submission System is Available Free to Interested Laboratories

The DxMONITOR Data Submission System (DDSS) is available free of charge to any laboratory interested in participating in the Veterinary Diagnostic Laboratory Reporting System (VDLRS). The DDSS has been developed to assist laboratories participating in the VDLRS with transfer of captured data to Fort Collins.

The system was not designed to capture data directly out of a laboratory's data management system. To use the system, data must first be captured by a laboratory in whatever manner works best for that particular laboratory. The summary totals of these data are then entered into the data entry screen provided as part of the DDSS. The reference guide leads the user through this process in a step-by-step manner.



Because the system was written within a software package called "Epi Info", a copy of this program and a user's guide are also included. Epi Info was developed by the Centers for Disease Control and the World Health Organization. It has many capabilities including data analysis, word processing, statistics, etc. Epi Info may be copied for friends and colleagues.

The following materials are included with the DxMONITOR Data Submission System:

- Epi Info program diskette
- Epi Info User's Guide
- DDSS program diskette
- DDSS Reference Guide

Please contact the staff in Fort Collins for more information about the system (address and telephone number are on the inside back cover of this issue).

Clip-out order form for copies of the DxMONITOR Animal Health Report, brochures, and committee reports.

Materials available from the Veterinary Diagnostic Laboratory Reporting System (VDLRS) are listed below. Complete this coupon and send it to:

USDA:APHIS:VS
Veterinary Diagnostic Laboratory
Reporting System
555 South Howes, Suite 200
Fort Collins, Colorado 80521-2586

(Please allow 3-4 weeks for delivery.)

Quantity

_____ **DxMONITOR Animal Health Report*** *(Quarterly report of VDLRS data)*

_____ **Introduction to the VDLRS** *(An informational brochure)*

_____ **Report of the 1991 DxMONITOR Committee Meeting** (August 1991)

_____ **Report of the 1990 VDLRS Planning Committee Meeting** (June 1990)

* The most recent issue of the DxMONITOR will be sent. If you want past issues, please call (303) 490-7800.

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Lab Notes and News Article Submissions Are Encouraged

Readers of the DxMONITOR Animal Health Report are encouraged to submit items suitable for "Lab Notes" or the "DxNEWS". All articles should be typed double spaced. Photos/artwork should be camera ready copy. If possible, please provide your article on diskette and indicate what type of software was used to create/store the file (i.e., WordPerfect, Word Star). Send submissions to the address on the inside back cover of this issue.

Interested Laboratories are Asked to Get Involved!

The Veterinary Diagnostic Laboratory Reporting System would like to expand the number of laboratories participating in the submission of data for the DxMONITOR Animal Health Report. For more information concerning participation, contact the staff at the address provided on the inside back cover of this issue.

Appendix

This section provides tables displaying the most recently reported diagnostic laboratory data.

Key to Tables in this Section:

- Data are presented by region of specimen origin and month of specimen submission.
- Values represent the number of positive tests (P) and the number of tests performed (T).
- Values reported in the "ALL" category represent all tests performed during the 3-month period (values for bovine leukosis represent a 6-month period). This category may include some tests for which a month of specimen submission was not known. Therefore, the sum of the monthly values may not be equal to the "ALL" values.
- Values reported for all diagnoses/agents are for months in 1992.
- In some cases, the reported total number of tests performed is a minimum because some laboratories were not able to determine the total number of negative tests performed.
- TOT = Total
- UNK = Unknown
- YTD = Year-To-Date
- Abbreviations for regions used in the tables are:

AK = Alaska
CL = Central
FL = Florida
HI = Hawaii
ME = Mideast
MN = Mountain
NC = North-Central
NE = Northeast
PA = Pacific
PR = Puerto Rico & U.S. Virgin Islands
SC = South-Central
SE = Southeast
SW = Southwest
UNK = Unknown

Appendix

Bovine Leukosis

Region

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Jan	P	436			23	0	17	449	82			61			1068
	T	1243			88	1	127	1922	204			111			3696
Feb	P	224	0		43	1	12	412	29		6	29			756
	T	919	1		131	1	100	1731	195		17	102			3197
Mar	P	223			165		78	404	77		0	26	0		973
	T	746			471		448	2165	245		2	65	7		4149
Apr	P	128			121	3	77	405	15		0	69	0		818
	T	753			334	4	484	3099	70		5	140	1		4890
May	P	181			183		31	303	46			174	0		918
	T	767			793		347	1560	162			310	2		3941
Jun	P	78			47		89	111	28			32			385
	T	532			301		394	361	137			81			1806
All	P	1270	46		664	4	304	2084	277		6	391	396		5442
	T	4960	183		2317	6	1900	10838	1013		24	809	1710		23760
YTD	P	1270	46		664	4	304	2084	277		6	391	396		5442
	T	4960	183		2317	6	1900	10838	1013		24	809	1710		23760

Equine Viral Arteritis

Region

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	0			3		0	8	11			0	1		23
	T	5			142		1	100	622			26	10		906
May	P	0			6	0	1	21	5			10	0		43
	T	10			139	3	2	95	292			27	67		635
Jun	P	0	0		8		0	12	5		0	1	0		26
	T	3	1		715		2	95	388		5	12	60		1282
All	P	0	2		17	0	1	41	21		0	11	1		94
	T	18	401		996	3	5	290	1302		5	65	137		3223
YTD	P	7	7		89	0	1	104	42		0	14	1		265
	T	86	1110		3659	11	8	739	2406		5	197	147		8369

Paratuberculosis

Bovine

Region

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Jan	P	20			11	0	10	1	4			2			48
	T	402			23	1	11	1	28			6			472
Feb	P	18			8		5	0	0			0			31
	T	187			24		5	16	99			3			334
Mar	P	29			8	0	8	1	0			2			48
	T	240			23	4	8	1	17			8			301
All	P	67	27		38	0	23	2	4			4			165
	T	829	72		159	5	24	18	144			17			1268
YTD	P	67	27		38	0	23	2	4			4			165
	T	829	72		159	5	24	18	144			17			1268

Ovine

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Jan	P	0													0
	T	1													1
Feb	P	0					1								1
	T	1					1								2
Mar	P														
	T														
All	P	0					1								1
	T	2					1								3
YTD	P	0					1								1
	T	2					1								3

Caprine

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Jan	P	0													0
	T	1													1
Feb	P														
	T														
Mar	P	1					1								2
	T	1					1								2
All	P	1	5				1								7
	T	2	15				1								18
YTD	P	1	5				1								7
	T	2	15				1								18

Appendix

Campylobacter

Beef Calves

		Region												
		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P														
	T														
May	P														
	T														
Jun	P														
	T														
All	P					0		0							0
	T					4		19							23
YTD	P					0		0	0			0			0
	T					4		26	2			17			49

Dairy Calves

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P														
	T														
May	P														
	T														
Jun	P														
	T														
All	P							0							0
	T							54							54
YTD	P							7	0			0			7
	T							178	6			16			200

All Calves

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P														
	T														
May	P														
	T														
Jun	P														
	T														
All	P					0		0							0
	T					4		77							81
YTD	P				0	0		7	0			0			7
	T				17	4		217	12			36			286

Clostridium perfringens Type C

Beef Calves

Region

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	1					10		1			1			13
	T	69					13		2			1			85
May	P	0					1		0						1
	T	45					1		1						47
Jun	P	1													1
	T	23													23
All	P	2					11		1			1			15
	T	137					14		3			1			155
YTD	P	2			0		17		4			2			25
	T	140			1		51		6			2			200

Dairy Calves

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	0					1								1
	T	16					1								17
May	P	0					0		0						0
	T	9					1		1						11
Jun	P	0													0
	T	10													10
All	P	0					1		0						1
	T	35					2		1						38
YTD	P	1			0		1		0						2
	T	44			1		196		1						242

All Calves

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	3			0		20		1			1			25
	T	120			1		216		2			1			340
May	P	1					4		0						5
	T	71					85		2						158
Jun	P	1					1								2
	T	42					29								71
All	P	5			0		25		1			1			32
	T	233			1		330		4			1			569
YTD	P	12			1		35		4			2			54
	T	308			6		747		7			2			1070

Escherichia coli

Beef Calves

		Region												
		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	5					10		0						15
	T	69					108		11						188
May	P	2			1		2		3						8
	T	43			1		28		34						106
Jun	P	0					1		4						5
	T	15					11		18						44
All	P	7			1	4	13	10	7						42
	T	127			1	4	147	19	63						361
YTD	P	7			1	4	29	16	11			2			70
	T	139			2	4	261	26	118			25			575

Dairy Calves

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	1			1		2		1						5
	T	11			1		14		2						28
May	P	0					0		7						7
	T	11					8		50						69
Jun	P	0					1		5			1			7
	T	8					9		7			2			26
All	P	1	1		1		3	32	13			1			52
	T	30	10		1		31	54	59			2			187
YTD	P	5	4		2		27	112	25			2			177
	T	50	37		3		275	178	103			19			665

All Calves

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	16			10	1	44		1						72
	T	129			23	5	397		13						567
May	P	6			2	1	16		10						35
	T	79			2	1	153		84						319
Jun	P	4					7		9			1			21
	T	33					56		25			2			116
All	P	26	1		58	6	67	44	20			1			223
	T	241	10		73	10	606	75	122			2			1139
YTD	P	50	4		115	6	133	137	36			4			485
	T	345	37		156	10	1191	215	226			59			2239

Salmonella

Beef Calves

Region

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	2			0		0		12			0			14
	T	86			3		150		40			3			282
May	P	1					0		8						9
	T	49					68		46						163
Jun	P	1					0		1						2
	T	21					24		34						79
All	P	4			7	0	0	0	21			0			32
	T	156			48	4	242	19	120			3			592
YTD	P	4			7	0	0	0	24			1			36
	T	173			53	4	402	26	198			26			882

Dairy Calves

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	0			1		1		13			1			16
	T	21			1		22		34			1			79
May	P	1					0		19			1			21
	T	13					21		56			3			93
Jun	P	0					0		0			2			2
	T	8					14		25			4			51
All	P	1	1		1		1	1	32			4			41
	T	42	10		1		57	54	115			8			287
YTD	P	4	7		2		15	3	54			9			94
	T	76	34		3		344	178	273			33			941

All Calves

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	6			3	0	2		25			1			37
	T	169			6	5	317		75			4			576
May	P	2			1	0	1		27		0	1			32
	T	91			3	1	163		102		1	3			364
Jun	P	1			1		0		1			2			5
	T	41			3		50		61			4			159
All	P	9	1		12	0	3	1	53		0	4			83
	T	301	10		57	10	530	77	238		1	11			1235
YTD	P	14	7		19	0	18	3	82		0	10			153
	T	434	34		155	10	1241	217	498		1	74			2664

Appendix

Coccidia Parasitism

Beef Calves

Region

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	1			1		2		1			3			8
	T	18			4		20		14			5			61
May	P	3					0								3
	T	19					21								40
Jun	P	5					1								6
	T	14					10								24
All	P	9			1		3	0	1			3			17
	T	51			4		51	1	14			5			126
YTD	P	9			3		5	0	17			4			38
	T	54			10		92	2	44			29			231

Dairy Calves

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	0					0		1						1
	T	5					6		16						27
May	P	0					0		4						4
	T	2					9		22						33
Jun	P	1					0								1
	T	5					1								6
All	P	1					0	2	5						8
	T	12					16	18	38						84
YTD	P	2			1		7	3	5			2			20
	T	24			1		219	47	126			11			428

All Calves

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	2			1	0	14		2			3			22
	T	57			17	1	238		30			5			348
May	P	4					5		4		0				13
	T	36					132		22		1				191
Jun	P	7					2								9
	T	32					44								76
All	P	13			1	0	21	2	6		0	3			46
	T	125			17	1	414	20	52		1	5			635
YTD	P	15			9	0	33	4	22		0	9	0		92
	T	208			110	1	852	51	180		1	51	1		1455

Cryptosporidia Parasitism

Beef Calves

Region

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	30			2		42		3						77
	T	78			3		131		23						235
May	P	16					26		8						50
	T	59					61		16						136
Jun	P	4					6		8			1			19
	T	20					19		27			2			68
All	P	50			2		74	1	19			1			147
	T	157			3		211	1	66			2			440
YTD	P	54			4		111	2	32			2			205
	T	174			8		355	2	135			21			695

Dairy Calves

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	9					4		2						15
	T	20					19		8						47
May	P	3					5		16						24
	T	14					19		28						61
Jun	P	2					6		2						10
	T	11					12		11						34
All	P	14	0				15	7	20						56
	T	45	10				50	18	47						170
YTD	P	20	5		6		110	18	69			2			230
	T	76	37		7		327	47	145			11			650

All Calves

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	53			18	0	82		6						159
	T	167			35	3	463		32						700
May	P	26			7	0	51		24		0				108
	T	106			8	1	192		44		1				352
Jun	P	8			5		17		12			1			43
	T	45			9		55		40			2			151
All	P	87	0		42	0	150	8	42		0	1			330
	T	318	10		100	4	710	20	116		1	2			1281
YTD	P	109	5		91	0	320	20	107		0	5	1		658
	T	451	37		217	4	1392	51	293		1	41	1		2488

Bovine Viral Diarrhea

Beef Calves

Region

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	8					2		0			0			10
	T	34					40		2			4			80
May	P	4					0		1						5
	T	19					18		12						49
Jun	P	0			1		0		1			1			3
	T	9			12		4		2			1			28
All	P	12			1		2	0	2			1			18
	T	62			12		62	7	16			5			164
YTD	P	12			2		5	0	3			1			23
	T	69			14		115	9	18			14			239

Dairy Calves

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	3					0		5						8
	T	8					10		17						35
May	P	0					1		1			0			2
	T	6					7		9			1			23
Jun	P	0					0		0						0
	T	5					3		3						11
All	P	3					1	6	6			0			16
	T	19					20	37	29			1			106
YTD	P	3			0		5	12	7			0			27
	T	29			1		237	119	70			1			457

All Calves

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	12			4	0	7		5			0			28
	T	77			4	4	269		21			4			379
May	P	6			7	0	3		2			0			18
	T	52			45	1	134		21			1			254
Jun	P	0			1		0		1			1			3
	T	22			12		39		5			1			79
All	P	22			12	0	10	6	8			1			59
	T	200			61	5	442	47	47			6			808
YTD	P	24			20	0	19	12	10			1			86
	T	272			170	5	918	135	107			26			1633

Coronavirus

Beef Calves

Region

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	9					24		3			1			37
	T	80					153		12			4			249
May	P	3					6		7						16
	T	40					66		14						120
Jun	P	1					0		7			0			8
	T	12					21		13			1			47
All	P	13	0				30	2	17			1			63
	T	132	2				240	7	39			5			425
YTD	P	17	0		0		51	2	23			2			95
	T	150	8		2		396	9	99			30			694

Dairy Calves

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	3					6		1						10
	T	21					21		7						49
May	P	1					8		7						16
	T	11					21		15						47
Jun	P	0					3		1			0			4
	T	1					13		9			3			26
All	P	4	0				17	1	9			0			31
	T	33	3				55	34	31			3			159
YTD	P	12	10		0		77	6	29			6			140
	T	66	46		1		340	114	101			27			695

All Calves

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	22			1	0	47		4			1			75
	T	165			1	5	300		19			4			494
May	P	7			0		20		14		0				41
	T	82			5		162		29		1				279
Jun	P	2			0		4		8			0			14
	T	23			8		46		22			4			103
All	P	31	0		2	0	71	3	26		0	1			134
	T	270	5		55	5	508	43	70		1	8			965
YTD	P	60	10		5	0	184	8	56		0	14			337
	T	394	54		133	5	1215	130	210		1	79			2221

Rotavirus

Beef Calves

Region

	CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr P	16					21		12			2			51
T	78					143		23			5			249
May P	19					10		7						36
T	48					66		16						130
Jun P	9					5		15			0			29
T	18					22		26			1			67
All P	44	0				36	0	34			2			116
T	144	2				231	7	65			6			455
YTD P	47	0		0		63	0	49			3			162
T	162	8		2		387	9	131			31			730

Dairy Calves

	CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr P	8					9		4						21
T	23					22		11						56
May P	3					6		5						14
T	13					21		30						64
Jun P	1					6		6			3			16
T	10					14		15			6			45
All P	12	0				21	0	15			3			51
T	46	3				57	34	56			6			202
YTD P	19	10		1		134	2	51			8			225
T	78	48		4		342	114	159			28			773

All Calves

	CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr P	41			12	0	63		16			2			134
T	165			22	5	494		35			5			726
May P	27			2	1	27		12		0				69
T	91			10	1	250		46		1				399
Jun P	15			3		14		21			3			56
T	38			12		79		43			7			179
All P	83	0		29	1	104	0	49		0	5			271
T	294	5		91	6	823	43	124		1	12			1399
YTD P	99	10		61	1	273	2	103		0	14			563
T	417	56		237	6	1530	130	302		1	76			2755

Etiologic Agents Associated with Piglet Diarrhea

Clostridium perfringens Type C

		Region												
		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	60					4				0				64
	T	169					13				5				187
May	P	9					1				0	0			10
	T	112					5				2	1			120
Jun	P	13					1				0	0			14
	T	117					2				1	2			122
All	P	82					6				0	0			88
	T	398					20				8	3			429
YTD	P	88			0		14				0	0	0		102
	T	557			2		282				8	3	1		853

Escherichia Coli

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	46				0	44		0		0	7			97
	T	216				1	109		2		4	13			345
May	P	43					29				2	5			79
	T	135					78				2	10			225
Jun	P	51			1	1	24		0		0	5			82
	T	131			1	1	80		1		1	13			228
All	P	140			32	1	97		0		2	17			289
	T	482			34	2	267		3		7	36			831
YTD	P	285			81	2	274		0		2	34	1		679
	T	810			87	4	791		9		7	99	1		1808

Coccidia Parasitism

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	13				0	7		1		0	2			23
	T	220				1	109		15		4	13			362
May	P	7					5				1	3			16
	T	141					75				2	8			226
Jun	P	10				0	7				0	3			20
	T	139				1	67				1	13			221
All	P	30				0	19		1		1	8			59
	T	500				2	251		15		7	34			809
YTD	P	55			1	0	60		1		1	16	0		134
	T	739			32	2	636		15		7	64	1		1496

Appendix

Etiologic Agents Associated with Piglet Diarrhea

Rotavirus

		Region												
		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	44				0	26		1		0	3			74
	T	191				1	94		6		5	15			312
May	P	41			0		29		0		0	3			73
	T	120			4		57		2		2	14			199
Jun	P	23			0	0	15				0	5			43
	T	116			2	1	44				1	17			181
All	P	108			3	0	70		1		0	11			193
	T	427			37	2	195		8		8	46			723
YTD	P	161			24	0	167		2		0	24	0		378
	T	702			202	4	715		22		8	107	1		1761

Transmissible Gastroenteritis

		CL	FL	HI	ME	MN	NC	NE	PA	PR	SC	SE	SW	UNK	TOT
Apr	P	19				0	10		0		0	5			34
	T	197				1	90		7		5	16			316
May	P	13			0		3		0		0	1			17
	T	114			4		56		2		2	12			190
Jun	P	10			0	0	1		0		0	2			13
	T	113			2	1	39		1		1	16			173
All	P	43			0	0	14		0		0	8			65
	T	456			6	2	185		10		8	44			711
YTD	P	97			11	0	78		3		0	22	0		211
	T	731			116	4	705		25		8	112	1		1702

Send all correspondence and address changes to:

USDA:APHIS:VS
DxMONITOR Animal Health Report
555 South Howes, Suite 200
Fort Collins, CO 80521-2586
(303) 490-7800

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